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# The Industrialist.

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# THE INDUSTRIALIST

VOL. 35.

MANHATTAN, KAN., OCT. 3, 1908.

No. 1

## ***The Agronomy Department at the Hutchinson State Fair.***

The exhibit made by the Agronomy Department at the Hutchinson State Fair was a great success. Thousands of people visited the booth each day and enjoyed looking over the fine display of wheat, corn, and other crops, and many made a more careful examination of the exhibit and stayed to ask questions and secure circulars, catalogues, and bulletins from Mr. E. Dana Trout, who was in charge of the exhibit. This is the second exhibit of the kind which Mr. Trout has had charge of, and he has proven his fitness for such work. The exhibit was not only artistically arranged but was planned so as to present, in succession, several phases of the work of the department.

Entering, at the left-hand side of the booth, the visitor observed an exhibit of "wheat breeding" by the "head-row method." On a large card in a few words in large letters the method of breeding was briefly explained, while results of the work were shown by samples of grain in small bottles with a table of records, giving records of head-rows in yield and grade of grain produced from individual heads. With a single variety the yields varied from 112 grams to 265 grams per head-row, while the samples graded from No. 1 hard to rejected. The wonder is that the crop produced by planting the seed from choice selected heads of a single variety on separate rows should give such variation in yield and quality of grain produced. The important point of this work, however, is that it will be possible to plant the product of some of the great producers in separate plots and thus produce an improved pedigree variety.

Passing further, the observer noticed the words in large type, "seed-wheat investigation," relating to the bill passed by the legislature two years ago. Carrying out the provisions of this bill, a large number of samples of seed-wheat have been imported from Russia and Alberta, Canada, for the purpose of planting and testing at the State Experiment Stations, and samples of this wheat were exhibited in small glass jars and were the source of much interest to the farmers and grain dealers.

On the wall above these exhibits was arranged in an attractive manner an exhibit of bundles of grain in the straw, grasses, clover, alfalfa, millet, and flax—products from the Experiment Station farm. On the back side of the booth were exhibited samples of small grains in open dishes and glass jars, with variety name and yield attached, and corn in the ear, while the wall above was decorated with bundles of wheat, oats, and other small grains, samples of the well-bred and best-producing varieties which have been grown and tested at the Experiment Station. Many of the best of these varieties have been grown in separate plots or in large fields for seed production, and more than 6000 bushels of improved seed of wheat, corn, and other grain, have been sold and distributed among the farmers of Kansas by the Agronomy Department during the past three years. Many favorable reports have been received from growers indicating that the improved seed grains have outyielded the ordinary seed from five to twenty-five per cent.

On the right-hand side of the booth the wall decoration of bundles of small grain was continued and the table below was filled with literature for free distribution, including College catalogues, bulletins of the Experiment Station, and circulars giving information regarding the culture and growing of the several farm crops. Several thousand circulars and advertising cards were distributed among the visitors, and the fact that these were cheerfully taken and carried away indicates the interest of the people in the Agricultural College and its work.

Mr. Trout was in attendance during the whole week. Professor TenEyck attended the fair on Thursday and Friday, judged the small grains and corn which was competing for premiums, and spent considerable time in the Agricultural College booth, where he was usually surrounded by a group of farmers explaining to them the exhibit and answering questions.

The Hutchinson fair officials generously paid all the expenses incurred in making this exhibit, so that the College was put to no expense in securing this advertising and adding to its already enviable reputation.

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Estebane Ibalio and Maurice Oteyza, both Filipino students, and members of the senior class, who have been attending College here, have left for other places. Ibalio is on his way back to the Islands and Oteyza will enter Yale. They were unusually bright students. Oteyza was one of the best violinists in College and a talented student in clay modeling.



*Farmers' Institutes.—First Fall Circuits.*

The Farmers' Institute Department of the Kansas State Agricultural College is now arranging for a great campaign of farmers' meetings for the fall and winter. Until October 19 most of the dates will be taken for local institutes, one-day sessions, dates thereafter to be reserved for two-day sessions, and for the most part for those who have boys' corn contests.

## CIRCUIT NO. 1.

|                                |                    |              |
|--------------------------------|--------------------|--------------|
| Wednesday.....                 | September 23.....  | Lone Star    |
| Thursday.....                  | September 24.....  | Vinland      |
| Friday .....                   | September 25.....  | Ottawa       |
| (Colored Farmers' Association) |                    |              |
| Saturday .....                 | September 26.....  | Wellsville   |
| Monday .....                   | September 28.....  | Rantoul      |
| Tuesday.....                   | September 29.....  | Olivet       |
| Wednesday.....                 | September 30.....  | Williamsburg |
| Thursday.....                  | October 1.....     | Waverly      |
| Friday.....                    | October 2.....     | Colony       |
| Saturday.....                  | October 3.....     | —            |
| Monday .....                   | October 5.....     | —            |
| Tuesday.....                   | October 6.....     | —            |
| Wednesday.....                 | October 7.....     | —            |
| Thursday, Friday ..            | October 8 and 9... | Indian Creek |

The week of October 12 is open for meetings if convenient circuits can be arranged.

## CIRCUIT NO. 2.

|                 |                   |             |
|-----------------|-------------------|-------------|
| Tuesday .....   | September 29..... | Inman       |
| Wednesday ..... | September 30..... | Doles' Park |
| (Grange Picnic) |                   |             |
| Thursday .....  | October 1.....    | Tampa       |
| Friday.....     | October 2.....    | —           |
| Saturday .....  | October 3.....    | —           |

## CIRCUIT NO. 3.

|                    |         |            |           |
|--------------------|---------|------------|-----------|
| Tuesday, Wednesday | October | 6 and 7... | Wakefield |
| Thursday .....     | October | 8.....     | Clyde     |
| Friday .....       | October | 9.....     | Clifton   |
| Saturday .....     | October | 10.....    | —         |

— Means open dates.

The superintendent of farmers' institutes hopes to start the regular fall circuits on October 19, if the boys' corn will be dry enough by October 12. Farmers who are interested and who live convenient to any of these circuits should ask for some of these open dates at once. It ought to be known by everybody by this time that these meetings cost nothing other than local expenses. The College prints posters and programs, sends the speakers and pays the railroad fare. There is nothing spectacular about these meetings; nothing but business—the business of finding better ways of tilling the soil and growing live stock, and making farm life more profitable and more attractive for old and young.

*The College Gets More Land.*

The Kansas State Agricultural College has had good luck with the last Congress. On its parting day we have received 7682 acres of land to be selected by the Board of Regents from any of the wild lands in the United States, as a part of the original endowment of 90,000 acres given to Kansas for the Agricultural College.

In 1862 Congress presented the State with 90,000 acres of land for this purpose. It was stipulated, however, that if the land was selected in a railroad grant, only half that amount should be taken. The Agricultural College selected its land and found that a part of it was in what was shown on the map to be a railroad grant. Consequently it did not get the full 90,000 acres. It got its full allotment outside of the railroad grant, but only one-half inside the grant. The amount it did not get because of the grant was 7682 acres.

But the railroad in whose grant the College selected its land was never built and the land reverted to the government. The State has been trying ever since to get the land that was coming to the Agricultural College, but the measure has always been defeated until the last session of Congress.

The bill granting the Agricultural College this land was tacked on to a Senate general land bill as an amendment from the House. The House passed it without question, and when it went back to the Senate that body, through Senator Long, adopted the house amendment. So the land is a reality and will be selected by the Regents some time soon. It will be impossible to get as valuable land as could have been secured when the College was really entitled to it, but seven thousand acres of most any Kansas land is something worth having.

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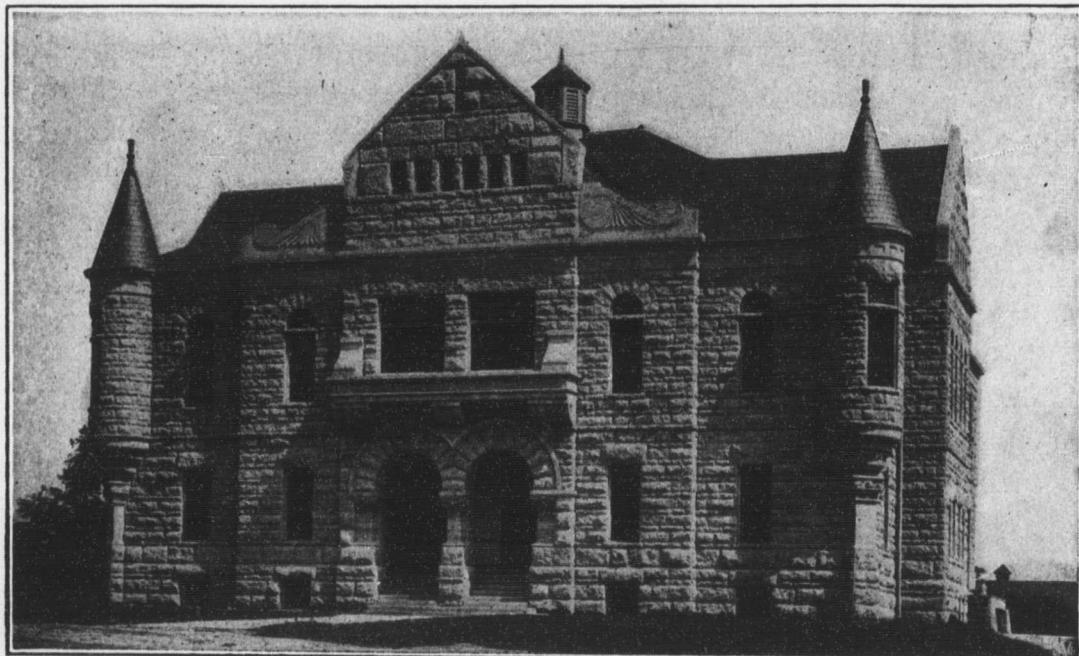
The College will soon be connected with the business part of the city and the railroad depots by an electric street-car line. The city council last week granted a franchise to West & Co., of Kansas City, for such a car line, and the company has already bought ground and commenced work on the electric station and the car barn. With the building of this line the College receives another boost. Not only will it be a great convenience to everyone connected with the College, but it will be the means of bringing us many visitors who heretofore have rather foregone a visit to the College when confronted by the prospect of wading a couple of miles through dust or mud. The route of the car line has not yet been decided upon.

*The Enrolment.*

The enrolment this fall term is fulfilling early expectations—that it would show another large increase over last year. Assistant Secretary Butterfield reports that on September 22, *i. e.*, at the close of the first week, the enrolment by classes was as follows:

|                   |          |
|-------------------|----------|
| Graduate.....     | 14       |
| Seniors.....      | 126      |
| Juniors.....      | 221      |
| Sophomores.....   | 346      |
| Freshmen.....     | 367      |
| Subfreshmen.....  | 331      |
| Preparatory.....  | 92       |
| Specials ..       | 19       |
| Short course..... | 100      |
| <br>Total.....    | <br>1616 |

Since then 59 names were added to the list, making the number enrolled on October 1, 1675, which is 240 above the enrolment of last year at this time, or, leaving out the 100 short-course students, 140 above last year's enrolment. Of these 1616 students who were present the first week 716 were in the regular four-year courses or graduate courses, which is certainly a gratifying condition of things. We are now certain that the next catalogue will print the names of nearly 2400 students present during the year.



Agricultural Hall

***Local Notes.***

Mr. Sieber, of the Chemical Department, is in the southern part of the State inspecting feed.

J. D. Botkin, democratic candidate for governor, spoke to the students in chapel last Saturday morning.

Professor Wheeler, of the Agronomy Department, will act as judge at the stock show at Yates Center this week.

Mr. D. Edmond Rudolph, of Zanesville, O., has arrived and has taken charge of the College band. Mr. Rudolph is a graduate of the Cincinnati College of Music and the Sumner Normal of Chicago.

Fifteen members of the stock-judging classes in the animal husbandry course will go to Wakefield Monday to judge short-horns on the Gifford ranch. Professor Kinzer will accompany the class. On the following Monday they will go to Horton for the same purpose.

The presidents of the colleges in Kansas will meet in Topeka, October 14, to discuss methods of giving credits from one college to another and to devise plans to make the work of the different schools more uniform. Kansas has about twenty-five schools of college rank, beside the State institutions.

Prof. Chas. Paul, who was formerly employed in the Mechanical Engineering Department of the College, has been elected professor of mechanical engineering at Armour Institute, Chicago. During recent years Professor Paul was located at Pennsylvania State College. Mrs. Paul will be remembered as a daughter of Mr. and Mrs. S. J. Yenawine, of this city.

Miss Ula Dow, Miss Clara Willis, Miss Marjorie Russell, Miss Bertha Johnston and Miss Grace Woodward were hostesses at a reception given last Monday afternoon at the home of Mr. and Mrs. J. E. Edgerton, complimentary to Mrs. Mary VanZile, the new professor in domestic science. About one hundred guests were received between the hours of 3 and 5 o'clock.

The new Y. M. C. A. Hall was formally dedicated Monday evening, September 21, by appropriate exercises. About 200 invited guests participated in the program, which was rendered in the spacious gymnasium hall. The main addresses were given by Rev. C. S. Cooper, of New York, the international secretary of Bible study of the Y. M. C. A., and K. A. Shumaker, the State Y. M. C. A. secretary.

Architect Howard M. Chandler, junior in this College in '97, writes to Professor Walters from Coatzacoaleas, V. C., Mexico, "I am located here for the present in the employ of the Oaxagnena Sugar Plantation Company to receive and forward a lot of building material and machinery to their plantation. Will probably be in Mexico until the first of the new year. Mexico in this section is very interesting, but warm."

The east basement room formerly occupied by the Printing Department as a composing-room has been fitted up with desks and is now used by classes in the Preparatory Department.

The Faculty roster of this number is well sprinkled with new names of professors and assistants. We have not the space to speak of them individually in this number, but shall endeavor to publish short biographical notes of every one of them in the near future.

Manhattan grew last year as it never grew before, and it is still expanding at a phenomenal rate. According to the figures of Secretary of Agriculture Coburn, it is now the twenty-fifth town in point of size in Kansas, with a population of 5706. Manhattan was next above Concordia last year and this year she is several points ahead. Manhattan's gain in population during the year was 1042. There were only three towns in the State which showed a greater gain.

At a students' meeting last week the Rooters' Club was reorganized and plans made for the football season. A novel design for a badge has been submitted to the club, which in all probability will be adopted as the official emblem. It is expected that a thousand members will be added to its rolls, and no doubt the Rooters' Club will be heard from at the football games. Officers were elected as follows: President, C. J. Stratton; vice-president, John Carnahan; secretary, Frank Parks; treasurer, Elmer Kittell.

The famous Banda Rossa, seventy-five strong, gave two of their concerts at the College Auditorium last week. The building was well filled, both in the afternoon and evening, and the audiences agreed that there is no better concert band on the road. The concerts formed number one of the College lecture course. The band cost the management of the course \$500, and it is gratifying that it proved a money-maker. The evening was given complimentary to holders of lecture-course tickets, and undoubtedly stimulated the sale of these tickets wonderfully, for 1500 tickets at \$2 each have already been sold. In addition the management took in \$400 in extra admissions to the matinee and evening concert.

Mr. John E. Smith, the newly elected assistant in the Department of Botany, is a native of Oregon, where he was raised on a farm in Polk county, 15 miles west of Salem. He attended the public school and high school of his home town, and graduated from the Holmes Business College. He then entered the Oregon Agricultural College, at Corvallis, in '98, and graduated as valedictorian of the '02 class, with the degree of B. S. He then taught science one year in the high school at Roseburg and three years at Salem. He holds a life diploma as teacher in the Oregon public schools, is a member of the Oregon State Academy of Sciences, and has done a large amount of graduate work in the University of Washington, Seattle, and University of Chicago. He comes to us well recommended and will undoubtedly prove a valuable addition to the Faculty.

The College Experiment Station has lately published and sent out press bulletins Nos. 165, 166, and 167, on the subjects of "Wheat Straw Worm," "Hog Cholera, and Vaccination as a Preventative Treatment," and "Insects Destructive to Grain in Bin and Granery," respectively.

The Dewey Dormitories, at the northeast corner of the City Park, were bought by Geo. T. Fielding, of Manhattan, who has renovated and painted them inside and out. The streets about the place were curbed and graded during the vacation, and the buildings look as good as new.

The College football schedule for the fall term, corrected to date, is as follows: October 3, Kansas Wesleyan University at Manhattan. October 10, Kansas University at Lawrence. October 20, Oklahoma University at Manhattan. October 28, Southwestern University at Manhattan. November 7, Creighton University at Omaha. November 14, Oklahoma Aggies at Manhattan. November 21, Washburn College at Topeka. November 26, Colorado Aggies at Manhattan. The home schedule is exceptionally strong this season. Admission to these five games singly will cost \$2.25, while by season tickets this is reduced to \$1.50. Season tickets may be had this week at Knostman's, Coons' and Elliot's, or may be purchased of student ticket-sellers. A very interesting race is on with three groups of ticket-sellers competing, the Hamps., Webs., and allies.

The College has done an enormous amount of building and repairing during the summer vacation and the ditches, piles of stone and lumber, derricks, etc., on the campus show that the good work is still going on. The new Domestic Science and Art Hall has been completed and is now being occupied, though the heating and plumbing is not finished. The new Veterinary Science Hall is nearly ready for occupation. Doctor Schoenleber and his assistants will probably be able to move into the new quarters before Christmas. The new greenhouse has received its glass roof and is now being finished. The old chapel has been divided into two floors. The lower (old) floor is still forming a fine auditorium, in many respects as good or better than before, while the upper floor has been changed into two large and well-lighted class rooms with attached offices for the Department of Architecture and Drawing. The main floor and basement of Kedzie Hall were transformed into a home for the Printing Department and the upper floor into five class rooms and two offices for the Department of English. The new Engineering Hall has been started and is now growing out of its foundation trenches. The new blacksmith shop and foundry are receiving their roofs. A large amount of work on sewer lines and heating tunnels is well under way. All tin and tin-shingle roofs have received an overhauling and a coat of paint, the blackboards have been reslated. Much calcining of class rooms was done, though all of the contemplated work in this line is not yet finished. In short, the vacation was a busy one "on the Hill."

The herd of show steers returned from the Interstate Stock Show at St. Joseph Sunday and brought \$200 in prizes back with them. They were shipped to Kansas City for the Royal Stock Show this week.

Prof. Frank Parsons, of Boston University, lecturer on social economy, died September 25, at his home in Boston, aged 54 years. Professor Parsons had suffered for the past two years, and had submitted to surgical operations several times. He attended Cornell, from which he was graduated in 1873, after having made a specialty of engineering. He then joined the engineering staff of a railroad and later took up the study of law and was admitted to the bar in 1881. He then opened offices in Boston. From 1897 to '99 Professor Parsons was professor of history and political science at the Kansas State Agricultural College. He previously had held a similar position in Boston University, where, in 1892, he became a lecturer on law. After leaving this College he became dean and professor of political science and later a director of the department of history in the bureau of economic research of Ruskin University. The professor was a kindly, warm-hearted man, somewhat reticent and peculiar in his habits. He will be remembered by all of his students as a thinker and a first-class teacher.

Mr. E. L. Conrad, the newly elected assistant professor of civil engineering of this College, comes to us from Lehigh University, South Bethlehem, Pa., where for the last two years he took post-graduate work and did teaching in the engineering course, and where last June he received the degree of M. Sc. Professor Conrad was born at Miles, Iowa, in 1879. After completing the public-school work there he entered the Academy of Cornell College in 1897 and graduated from the civil engineering course in 1904, receiving the degree of B. Sc. of C. E. In 1906 he received the degree of C. E. from the same institution, awarded for two years postgraduate work *in absentia*. His first civil engineering practice he had with the Union Pacific railway in Wyoming and Utah. In the spring of 1900 he worked with the Illinois Central railway in the Yazoo delta, later going to Vicksburg, where he assisted on the road surveys of the Vicksburg National Military Park. In the summer of 1901 he worked on railroad location with the Choctaw, Oklahoma and Gulf railway in Oklahoma and southern Kansas. In the spring of 1902 he went again to Mexico, where he remained for a year working on the survey of the mountain division of the proposed new line between the city of Mexico and Tampico. Later he was employed by the well-known English contracting firm of S. Pierson and Sons. With these he stayed about a year and a half, assisting in the construction of the terminal yards of the Tehuantepec route in Mexico. The severe climate here told on his health, and he was compelled to return to the United States. Professor Conrad is an active, energetic young man who will undoubtedly make the newly organized course in civil engineering a success.

*Alumni and Former Students.*

C. H. Withington, '06, has been appointed museum assistant in entomology in the University of Kansas.

P. A. Cooley, '06, and Miss Nellie Shewmaker, of Buffalo, Mo., were married at Salina, Kan., July 3, 1908.

Born, to F. E. Uhl, '96, and Margaret (Correll) Uhl, '97, in Kansas City, Kan., a son, on September 19, 1908.

Dr. Raymond H. Pond, '98, has been appointed biologist of the Metropolitan Sewerage Commission of New York City.

Myrtle (Mather) Romine, '02, and her husband, of Mooresville, Ind., are happy in the birth of a daughter, Theodora, September 1, 1908.

A. D. Holloway, '07, is engaged in extension work for the Y. M. C. A., organizing associations in small towns. His address is Wakefield, Neb.

Married, Tuesday, June 30, 1908, at Hooker, S. D., Miss Lettie Lavina Potts and Mr. H. B. Holroyd, '03. Their home will be in Boulder, Colo.

F. J. Rogers, '85, has been promoted from the assistant professorship to be associate professor of physics in Leland Stanford, Jr., University.

Leonore is the name of the little daughter who came to the home of Schuyler Nichols, '98, and Mrs. Nichols on September 11, 1908, Herington, Kan.

Grace Allingham, '04, is filling the place of Alice Loomis, '04, in the Normal School at Peru, Neb. Miss Loomis is attending Teachers' College, Columbia University.

On the faculty of the Goshen City High School, Goshen, Ind., we find the names of L. M. Jorgenson and J. R. Coxen, both of the class of 1907, as instructors in mathematics.

F. V. Dial, '97, and Kate Cooper, '08, were married Friday evening, July 24, at the home of the bride's father in Manhattan, and are now at home at "The Cedars," Cleburne, Kan.

The Manhattan city schools added to their number of teachers who are graduates of this institution by employing for this year Minnie Deibler, '05, Doris Train, '06, and Clara Schild, '08.

Lotta I. Crawford, '02, has resigned her position in the Colorado Agricultural College to become assistant in domestic science in the University of Wyoming. Miss Minnie A. N. Stoner, formerly of this institution, is head of the department.

C. M. Correll and Laura (Trumbull) Correll, of the class of 1900, with their daughter Helen, were also Manhattan visitors for some days before they left for their North Dakota home at Mayville, where Mr. Correll has been elected to teach history in the Normal School there.

Married, Tuesday, June 16, 1908, Miss Grace Fannie Grant and Mr. Robert McIlvaine, '92, at The Dalles, Oregon. They are at home at Simnasho, Ore.

Mary (O'Daniel) Scott, '04, who spent the summer in Manhattan and vicinity, left early in September for her home, Gainesville, Fla. Prof. J. M. Scott, '04, visited here a short time after Commencement, then returned to his work in agriculture at the Florida Experiment Station.

H. F. Butterfield and Florence (Vail) Butterfield, '01, and little son Vail spent a few days visiting relatives and friends in Manhattan in September, on their way to their new home at Mayville, N. D., where Mr. Butterfield has charge of the work in manual training in the State Normal School.

Daisye Harner, '06, has accepted a position as professor of domestic science in Norfolk College, Norfolk, Va., and left here September 30 to take up her work immediately. Mary Hamilton, '06, resigned this position to accept one at Lincoln, Neb., as teacher of domestic science in the high school.

J. C. Cunningham, '05, has been appointed assistant in horticulture at this institution and has entered upon his duties. The practical work in which he has been engaged since his graduation added to his previous training will, in connection with his natural ability, undoubtedly enable him to fill the position with great credit.

Fannie (Waugh) Davis, '91, writes a very enthusiastic letter concerning Douglass Powell Davis, who has gladdened the home of herself and K. C. Davis, '91, since September 2, 1908. They are now living at 140 Hamilton street, New Brunswick, N. J. Professor Davis is now connected with the New Jersey Agricultural College.

A. H. Leidigh, '02, recently superintendent of the Amarillo, Texas, Experimental Farm, is joint author with Carleton R. Ball of Farmers' Bulletin No. 322, on "Milo as a Dry-land Grain Crop." This treats of milo maize, its characteristics, methods of culture and handling, and is a valuable addition to the available information concerning the non-saccharine sorghums.

Dalinda (Mason) Cotey, '81, was obliged to resign the position here as professor of domestic science, to which she was elected last June, on account of seriously impaired health. This was a great disappointment to herself and her friends, as her attachment to the institution and her years of experience would have combined to make her administration a success.

The many friends of Edith A. Goodwin were greatly shocked in hearing of her death, which occurred Friday, September 25. A slight cold contracted a few days before resulted in fatal complications. Miss Goodwin attended the University last year and did very earnest and creditable work. She was in a somewhat exhausted condition when she went home about the middle of the summer, and had never recovered her normal strength.

Mary (Pierce) VanZile, who was elected professor of domestic science on the resignation of Mrs. Cotey, will be remembered as one of the excellent students of the sophomore class in 1891. After the death, in 1899, of her husband, Gilbert VanZile, '90, she attended the Iowa State College, from which she was graduated in 1904. Since then she has had experience as a teacher of domestic science at the Iowa State College and in Chicago, and will doubtless succeed in the larger field here.

A wedding of interest to a number of Manhattan people has been announced for October 13, in which Arthur B. Gahan, a former Manhattan boy, and Miss Emily Bonnet, of Berwyn, Md., will be the principals. The marriage will take place at Berwyn Chapel, after which Mr. Gahan will bring his bride to Manhattan for a visit with relatives. Mr. Gahan graduated from the K. S. A. C. with the '03 class and is now employed as assistant entomologist in the Maryland Experiment Station, at College Park, Md.—*Republic.*

A wedding which will interest many Manhattan people occurred August 19 at Green, Kan., when Miss Dickie Davis became the bride of Mr. William C. Lane, of this city. Both parties are well known in Manhattan, Mr. Lane being an instructor in physics at the College, and a member of the class of '05, while Miss Davis was also a student at College a few years ago, having been a member of the same class. She has many friends in this city, to whom she has frequently paid visits, and who will be interested to know of her marriage.—*Nationalist.*

Many members of the class of 1908 have secured positions, and below we give those concerning which we have information: Edna Biddison is teaching mathematics, English classics and botany in the high school at White Cloud, Kan. J. E. Brock is principal of the schools of Troy, Kan. Elsie Tulloss has the work of inaugurating the work in domestic science in the high school of Ottawa, Kan. Edith Justin is teaching domestic science in the Girls' Industrial School, at Beloit, Kan. Elsie Kratzinger has charge of the domestic science work in the schools of Carbondale, Ill. Helen Halm has charge of household economics in the high school of Corsicana, Texas.

Changes of address: Adelaide Strite, '01, East 1418 Courtland Ave., Spokane, Wash.; R. G. Lawry, '03, 319 West 72nd street, Chicago, Ill.; J. C. Christensen, '94, Leonardville, Kan.; Dr. J. W. Fields, '03, McPherson, Kan.; C. H. Withington, '06, U. of K., Lawrence, Kan.; Alfred H. Baird, '07, Minneapolis, Kan.; Harry C. Turner, '01, Fort Bayard, N. M.; May Harman, Grund Hotel, Kansas City, Kan.; Alfred C. Smith, '97, and Mary (Waugh) Smith, '99, 406 Tenth Avenue, North, Seattle, Wash.; E. C. Gardner, '04, 4341 Michigan Avenue, Chicago, Ill.; W. H. Sanders, '89, and Hattie (Gale) Sanders, '89, Manhattan, Kan.; Geo. V. Johnson, '91, Portales, N. M.; Gertrude (Coburn) Jessup, '91, 426 Topeka Avenue, Topeka, Kan.

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(Board of Instruction concluded on last page.)

# THE INDUSTRIALIST

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No. 2

## *Engineering Legally a Department of the Kansas State Agricultural College.*

Some time ago Governor Hoch called a conference of the regents of the University, Normal School and Agricultural College to consider means of avoiding duplication of courses at these institutions. It was reported in the newspapers, evidently from a prejudiced source, that the University was back of this conference idea and that the real purpose was to create sentiment to take the engineering courses from the Agricultural College. Hon. A. M. Story, President of the Board of Regents of the Agricultural College, presented the following report, which was a great surprise to those attending the conference, proving conclusively that mechanic arts, which must necessarily include all structural training, mechanical, electrical, civil and mining engineering, legally belong to the Agricultural College, and that the University has no educational nor legal right to maintain these courses. More will be said on the subject later, but it will be well for thoughtful Kansans to read the following report submitted by Judge Story:

“It has come to the knowledge of members of this committee that the State University desires to get the Engineering Department from the Agricultural College. In my opinion, that is the principal subject to be considered at this time. I have given the matter such thought as I have had time and opportunity to give, and have arrived at a very positive conclusion on this question.

“It will probably be necessary to consider briefly the law which led to the establishment of the Agricultural College at Manhattan.

### THE LAW IN THE CASE.

“July 2, 1862, President Lincoln signed what is known as the ‘Land Grant Act,’ an act providing for the granting of lands to the states that should maintain schools where certain things were taught. The author of this act was Justin S. Morrill, of Vermont, said to be a son and a grandson and a brother of a village blacksmith. Said act was entitled ‘An act donating public lands to the several states and territories which may provide colleges for the

benefit of agriculture and the mechanic arts.' Section 4 of such act reads as follows:

"SEC. 4. That all moneys derived from the sale of the lands aforesaid by the states to which the lands are apportioned, and from the sales of land scrip hereinbefore provided for, shall be invested in stocks of the United States, or of the states, or some other safe stocks, yielding not less than five per centum upon the par value of said stocks; and that the moneys so invested shall constitute a perpetual fund, the capital of which shall remain forever undiminished (except so far as may be provided in section fifth of this act), and the interest of which shall be inviolably appropriated, by each state which may take and claim the benefit of this act, to the endowment, support and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.'

"You will observe by a careful reading of said section that Senator Morrill had in mind the education of a certain class of people. It seems strange, in the light of the present day, that it was necessary, or considered necessary, to provide by law for the education of certain classes. However, when we look at the educational system as it was in 1862, and prior to that time, we find that there was no system of higher education within the reach of the classes or class that Senator Morrill sought to benefit. The colleges were of the old classical style. They educated lawyers, doctors, and ministers. At that time there were but four or five schools or colleges in the United States teaching engineering in any of its phases. Senator Morrill, himself not a college graduate, being a small farmer and country storekeeper, but a man of good judgment and great preception, saw the necessity of doing something that would permit and encourage the education of the industrial classes.

#### EARLY NEED OF INDUSTRIAL TRAINING.

"With this in view a similar bill had been introduced in Congress in 1857, and was finally passed in 1859 and promptly vetoed by President Buchanan. Among other things contained in the veto message of President Buchanan we find the following: 'Under this bill it is provided that scientific and classical studies shall not be excluded from them. Indeed, it would be almost impossible to

sustain them without such provision; for no father would incur the expense of sending a son to one of these institutions for the sole purpose of making him a scientific farmer or mechanic.' Senator Morrill, in his remarks on said bill at the time said veto message was read, among other things said: 'The president wholly mistakes the object of the bill, which was to offer tuition to the boys of farmers and mechanics (not to enrich corporations and endow professorships), and to enable them by their own industry to acquire what might not otherwise be within their reach—a liberal education. If it be a satisfaction to the president to have thwarted such an object I hardly think it will be highly appreciated, and especially not by those whose hopes are thus destroyed. The telegraphic news of this veto will start a tear from the eye of more than one manly boy whose ambition will now be nipped in the bud. One great object was to raise the degenerate and downward system of agriculture by which American soil is rapidly obtaining the rank of the poorest and least productive on the globe, and to give to farmers and mechanics that prestige and standing in life which liberal culture and recognition of the government might afford. To all these the president turns a deaf ear.'

'With this brief expression of the intent of this act, let us inspect the fourth section.

"Among other things said section provides that this money should be used for 'the endowment, support and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to *agriculture and the mechanic arts*.' It will be seen by this that certain things *were* to be taught; that certain other things *might* be taught. It is certain from this that military tactics *must* be taught. It is also certain that such branches of learning as are related to agriculture *must* be taught; it is also certain that such branches of learning as are related to the mechanic arts *must* be taught. The agricultural college founded under this act can teach the classics, if they so desire. The education provided for in this act along certain specific lines was to be of a certain grade or character.

#### LIBERAL COURSE OF STUDY INTENDED.

"The act provides that this education must be liberal and practical, and not of the manual training grade. This education was to be so liberal and so practical as to fit and qualify the industrial classes for the several pursuits and professions in life. It seems very clear to me that under the provisions of this act, while shop

work is very essential and desirable, yet it by no means fills the requirements of the bill. The education provided for was not to be so much the education of the hands as an intellectual education along certain lines.

"Along about 1890 in the state of Vermont there was an effort made (as is suggested for Kansas at this time by certain influences) to make the agricultural college established under this act an agricultural college which should *teach nothing except agriculture*. Senator Morrill appeared before the legislature in Vermont to give his idea of the intention of the original 'Land Grant Act,' and as to whether or not the state should or could direct that nothing but agriculture could be taught in its agricultural college. Senator Morrill said: "The object of the act of 1862 was to give a chance to the industrial classes of the country to obtain a liberal education, something more than was bestowed by our universities and colleges in general, which seemed to be based more on the English plan of giving education only to what might be called the professional classes—in law, medicine and theology."

QUOTES THE AUTHOR OF THE LAW.

"In respect to the proposed change in Vermont, Senator Morrill said: 'I would regard that as a revolution and subversion of the whole idea of the Land Grant Act of 1862, which was of a much broader meaning. It included, to be sure, the idea that agriculture and mechanic arts were to have a leading or first position, but it included much more. It was for the industrial classes; to promote their instruction generally, and it was not to exclude even the classics. Therefore, I should regard any change from the original plan as a diversion of the fund and a revolution of the whole practical idea.'

"Having thus briefly outlined the act and Senator Morrill's opinion as to its intention, we will now proceed to ascertain what the State of Kansas did toward availing itself of the provisions of the act.

"In February, 1863, we find that the State of Kansas accepted the provisions of this act in language as follows, being section 6812 of the general statutes of 1901:

"6812. Acceptance. Sec. 292. That the provisions of the act of Congress entitled 'An act donating public lands to the several states and territories which may provide colleges for the benefit of agriculture and mechanic arts,' approved July 2, 1862, are hereby accepted by the State of Kansas; and the State hereby agrees and obligates itself to comply with all the provisions of said act.'

"We also find that in the same month the legislature located the college provided for under the congressional enactment of 1862 at Manhattan, Kan., in words as follows, to-wit:

"6814. Preamble. Sec. 204. Whereas, the Congress of the United States, by an act approved July 2, 1862, and entitled "An act donating public lands to the several states and territories which may provide colleges for the benefit of the agricultural and the mechanic arts," granted to the State of Kansas, upon certain conditions, ninety thousand acres of public lands for the endowment, support and maintenance of a college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life; and whereas, the State of Kansas by its legislature has expressed its acceptance of the benefits of the said act of Congress, and has agreed to fulfill the conditions therein contained.'

"It must be conceded that certain studies or a certain line of work was required to be given in the colleges founded under the Land Grant Act, and that Kansas fully realized this, as in the preamble to the act locating the agricultural college such requirements were enumerated. I believe it is a fact that the State of Kansas cannot take from, in any particular, the requirements as set out in the law of 1862. It is possible that Kansas might add to the work to be done in such institution, but it absolutely cannot take from. Under the government act, a state in order to avail itself of provisions should indicate its acceptance of the terms of the act within two years from July 2, 1862, and within five years from July 2, 1862, should provide the college where such studies should be taught. The State of Kansas within eight months from the time of the passage of the Land Grant Act properly accepted its terms, and within the same time located the institution for the carrying out of the terms of the said act. There is a serious doubt in my mind as to whether the State of Kansas at this time, after the expiration of more than forty-five years from July 2, 1862, has any right or could possibly change even the location of the institution which was established in 1863 at Manhattan. Kansas has received as an endowment over \$500,000 under the provisions of that act. This money arose from the sale of a little over 82,000 acres of land.

## THE DEMAND FOR MECHANICAL TRAINING.

"There has been some criticism as to the growth of engineering in the agricultural colleges. It has been claimed that it is out of proportion when compared with the growth of the agricultural end of the institution. It might be observed that since the civil war this country has experienced the greatest commercial and industrial growth in its history, and that as a result skilled men in either commercial or industrial life have been in demand. People are getting to be very practical. There is a demand for an education which will fit a young man, or young woman, to do things; to do things for which there is a demand, to enable them to take part in the development of the commercial and industrial work of the times. There is a large demand for young men graduates of engineering schools. As long as such demand exists young men will be provided to fill the positions; they will be in the drafting room; they will be engaged in the designing, the construction and the operation of machines and appliances. It is just as necessary in the interest of agriculture and farming that some man make or construct a self-binder as it is that some man sit on the binder and operate it in the actual work of cutting the grain. One man must make a cultivator, another must hold the handles in the field. One man must survey the route where the railroad is built, another will raise the wheat that is shipped over the line, and a mill will be constructed by other skilled men. It is the rankest nonsense for any man to say that all farmers' boys should be farmers. Develop the young man along lines for which he is adapted. If it be farming, he should follow that; if it be something else, he should follow that.

## ITS BROADER PURPOSES.

"The Kansas State Agricultural College is not merely a college exclusively for the education of farmers—it is a college specially for the education of the industrial classes. This institution educates young men along liberal and practical lines for the several pursuits and professions of life as provided in the original Land Grant Act. There is nothing abstract; it is mighty practical. Here a democratic atmosphere prevails. All meet on an equal. It makes no difference what course a young man takes, he has the same standing, if he possesses the natural qualities of manhood, that any other student has.

## PROVINCE OF THE UNIVERSITY.

"Let us now take up a little of the work of the University of Kansas and examine it. I find that in 1889 the legislature revised the law applicable to the University and provided that it

should consist of three departments. First, a department of literature. Second, a department of the sciences. Third, a department of the arts. That is the only law that defines or declares what the University may or shall teach. Within these three departments it must operate. There is no law authorizing the University to conduct an agricultural department, or to conduct agricultural investigation at all. There is no law authorizing the University to conduct a normal department. I may be wrong in my conclusions, but it is my opinion, nevertheless, that the only law existing which would authorize the University to conduct its engineering departments is the law appropriating funds for the erection of its engineering buildings, the purchase of apparatus and their maintenance. I do not believe that the teaching of engineering is necessarily a part of university work. The universities of the western states started out along the same lines as the old classical colleges of the East. After the colleges established under the Land Grant Act got into operation and were giving the industrial classes an education along industrial and practical lines, and when it became evident that such education was the education which the people were demanding, the universities of the western states sought to change and did change their several courses to include just as many industrials as possible.

"I am making no objections at this time to the engineering in the University. I think it tends a whole lot to dignify the institution and bring it down to my idea of what a college should give—an education which enables people to do things.

#### CHARGES ENCROACHMENT BY KANSAS UNIVERSITY.

"By examination of the University catalogue of 1908, on page 63, I find the following: 'The 1897 session of the legislature created the State entomological commission. The field work of this commission is conducted by the departments of entomology at the University and the Agricultural College. The University is performing the work of inspecting nurseries and issuing certificates, and has since the beginning of such requirements in 1896. It has also conducted some extensive investigations in the interest of agriculture and horticulture. Under this commission the department of entomology of the University will cover a much wider field and will publish from time to time the results of its work.'

"In this matter the University is absolutely out of its line of work. It does teach, and should teach, entomology, but it should not be permitted to use its funds and its efforts along the lines which purely and positively belong to the Agricultural Experi-

ment Station, which station is fully and amply equipped to do such work. It proposes to 'publish from time to time the results of its work.' In this we presume that it means that it will issue bulletins, something wholly beyond its authority, and an invasion of the rights of the Agricultural College.

"On page 113 we find the following: 'The University offers for next year a few courses in domestic science. These courses are of strictly University grade, and if experience warrants will be added to as time goes on until a fully formulated course results.'

"This is a mighty fine thing, but absolutely out of harmony and out of keeping with a university.

"This is mentioned to show the tendency of the University toward spreading out and absorbing the work of other institutions. It shows the tendency of the University to get out of its own proper sphere or field of operation. It shows its desire to adopt the ideas of the land-grant colleges. It shows its disposition to duplicate the work of other institutions. It shows its disposition to absolutely disregard the purposes for which it was established, and to go chasing around for popular things.

#### CASE OF THE STATE NORMAL.

"I notice on page 126 there is a department known as 'Education.' I find that under this heading is sought to be given to some extent a normal training, and from the course of study outlined I would consider it quite complete. There might be no objection to this, and certainly would be none on the part of the representatives of the Agricultural College, were it not that this department, when considered in connection with the University's high school visitation department, gives an unfair advantage to University graduates over those of either the Agricultural College or the Normal. I am not going to charge the University authorities with anything unprofessional, but I know it to be a fact that many high schools of the State of Kansas not only refuse but are actually afraid to employ a principal or teachers for the high school until they correspond or confer with the University authority having charge of the high school visitation. We have in the State Normal School an institution specially prepared to graduate school-teachers, and it does it, and yet those teachers are being discriminated against; at least until graduates of the department of education of the University are placed.

"From the above statements I believe it can clearly be inferred that the Kansas State Agricultural College is not unnecessarily duplicating work. I believe it is doing no work except that required by congressional enactment, and that the work it is doing

is absolutely necessary in order to comply with the provisions of such act. On the other hand, I believe that the University is unnecessarily duplicating work which actually belongs to the other institutions; that if there is any fault on the part of any institution along these lines it is on the part of the University.

#### PROVINCE OF THE AGRICULTURAL COLLEGE.

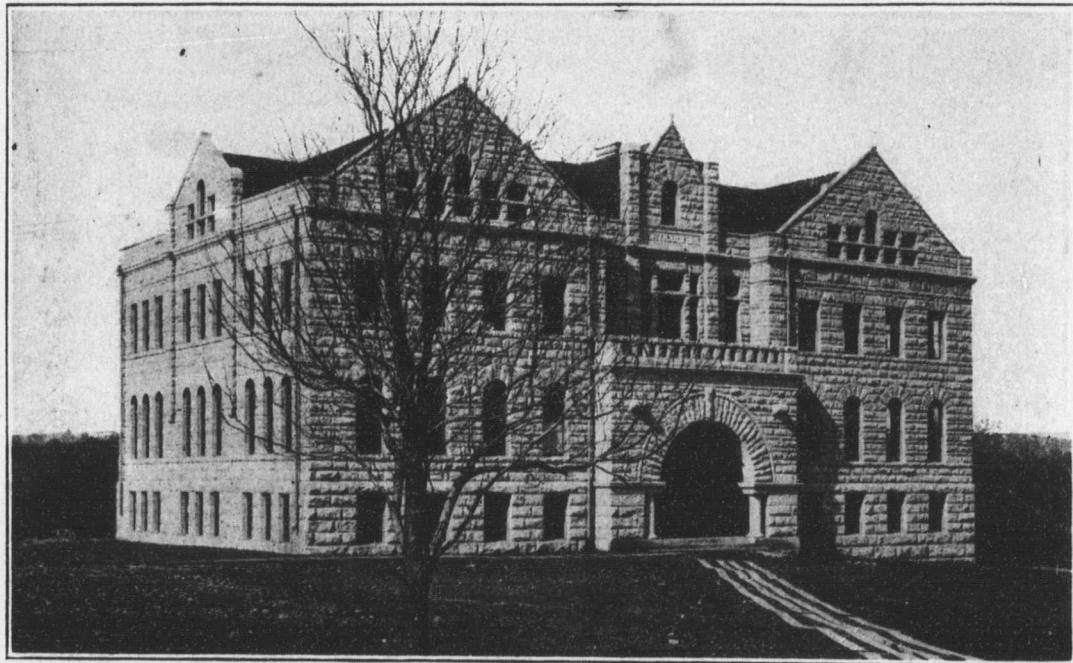
"I realize that there is now and has been in the minds of a great many people in the State of Kansas a notion that the Agricultural College was established merely to teach agriculture. I hope I have sufficiently shown in this report that such is not the case. That while that is one of the subjects required to be taught, yet this College was founded for the purpose of educating the industrial classes, and not educating people exclusively in agriculture. I am inclined to think that the State of Kansas, having accepted the provisions of the original Land Grant Act, and having accepted an endowment which will amount to at least \$500,000, and having established an institution in accordance with said Land Grant Act, and having taken part in the development of a new and the greatest educational system the world has ever seen, the education of the industrial classes, that after forty-five years the State of Kansas will not by a legislative enactment, or otherwise, say to the world that when Kansas accepted the provisions of said act it did intend honestly to keep its pledge. This College was established absolutely in accordance with congressional enactment. The only thing which the Kansas legislature had the right to do was to accept its terms and, if desired, establish its school and maintain it. This it could do as it thought best. Having done it, I regard the whole question as settled.

#### PECULIAR DIVISION OF FUNDS.

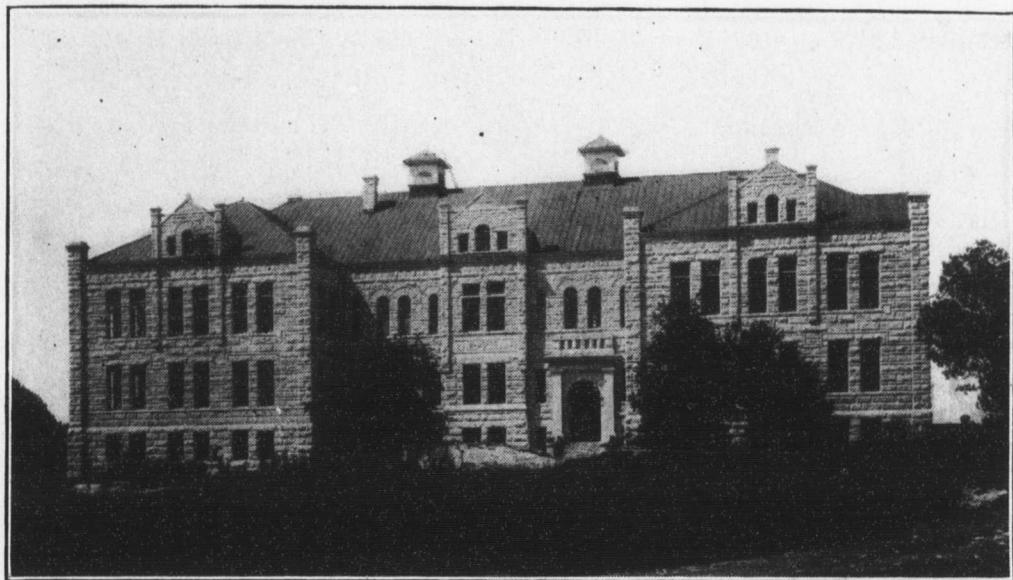
"Passing to another feature of the case, and a mighty interesting one, too, I find that the State has appropriated to the Agricultural College, for all purposes, \$1,888,523. I find that the State has appropriated to the University just about four million dollars. I also find that the enrolment at the Agricultural College for several years has exceeded the enrolment of the University. I find that the legislature of 1907 gave the Agricultural College, for the years 1908 and 1909, a total of \$295,000. The same legislature gave the University \$491,000 for current expenses. In addition to the amount given the Agricultural College it gets its interest on its endowment, and also money under the Hatch Act, Morrill Act, etc., which will amount to probably \$90,000. This money is used largely in the Experiment Station and directly applied to

agricultural experiments. In addition to the above the University will receive endowment interest to the amount of several thousand dollars. Taking into consideration the fact that each of these institutions takes care of practically the same number of students, is there not an unequal division of funds? It strikes me that there should be some way devised that no educational institution should suffer from lack of funds, but that all funds used for educational purposes should be so managed that the greatest good would result. It is true that there is a large expenditure of money in the State of Kansas for educational purposes, and I am speaking only of these three institutions, but I believe it to be true also that there is no state in the union that is to-day educating a larger per cent of its young men and women or educating them at less per capita expense than the State of Kansas.

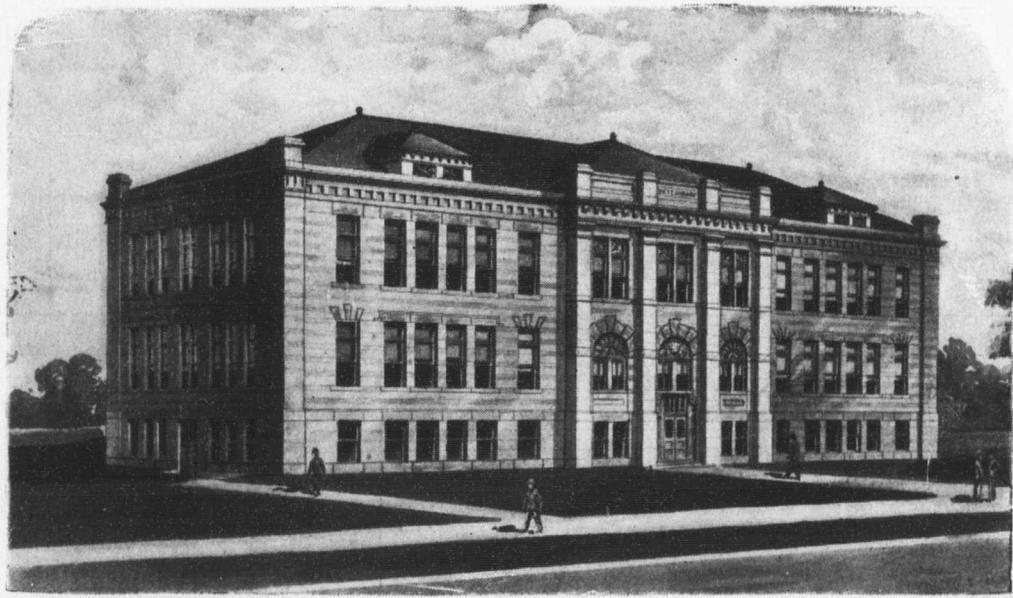
"The University has always had the big end of the appropriations in the State. It has had practically all it asked for. It has brooked no interference. It has taken everything it desired in the way of new courses and new work. And now after engineering has been in the Agricultural College since the College was established under the Land Grant Act, it comes forward and demands that the engineering be taken from that institution and given to it. This question will be settled, and when it is settled it will be found that the Agricultural College still has its engineering. It belongs to it legally and properly. It is an industrial work—something that does not pertain to true university life."



Horticultural Hall.



New Domestic Science and Art Hall is 92 x 176 feet, having two stories and basement. The basement and first floor contain classrooms, laboratories and offices for the Domestic Science Department; the second contains sewing-rooms and offices for the Domestic Art Department. Cost of building, \$70,000. Value of apparatus and equipment: Domestic science, \$2430; domestic art, \$970.



New Veterinary Science Hall is 113 x 155 feet, having two stories and basement. It contains demonstration-rooms, classrooms, laboratories and offices for the Departments of Veterinary Science and Bacteriology. Cost of building, \$56,000. Value of apparatus and equipment: Veterinary science, \$8207; bacteriology, \$2450.

***Annual Cost to the State to Give a Boy or Girl a College Education.***

The following table shows the annual cost per student in twenty-two state educational institutions of the north Middle West. The figures are taken from the reports of the commissioner of education for the seven years 1900 to 1906, inclusive. These are the latest reports available. The income is the total from all sources and for all purposes, including salaries, buildings, and equipment. The Kansas State Agricultural College has been run for less per student than any other institution named—forty-one per cent less than the average of the agricultural colleges and forty-six per cent less than the general average of the twenty-two. Few people of the State realize just what this means; many connected with the College probably do not. It means large classes and many of them for each teacher. It means lack of buildings, equipment, and land. It means that the College ought to have had \$96,904 more money per year to have been on a par with the other agricultural colleges, or \$678,328 for the seven years. It means that the young men and young women have lost some opportunities that other states have offered to their young people. Figures are not very attractive, but every Kansan can afford to study this table.

AGRICULTURAL COLLEGES.

STATES.	Enrolment.	Income.	Annual Cost.
Colorado.....	446	\$113,394	\$254
Indiana.....	1347	230,535	171
Iowa.....	1630	310,971	191
Kansas.....	1441	147,150	109
Michigan.....	802	259,572	324
N. Dakota.....	647	101,411	157
Oklahoma.....	500	84,413	169
S. Dakota.....	515	98,472	191
<b>Average.....</b>	<b>916</b>	<b>168,240</b>	<b>184</b>

UNIVERSITIES.

Colorado.....	957	\$121,020	126
Indiana.....	1350	209,982	159
Iowa.....	1534	381,167	248
Kansas.....	1341	224,236	167
Michigan.....	3784	720,331	190
N. Dakota.....	407	85,562	210
Oklahoma.....	434	76,807	177
S. Dakota.....	373	71,064	190
<b>Average.....</b>	<b>1273</b>	<b>236,271</b>	<b>186</b>

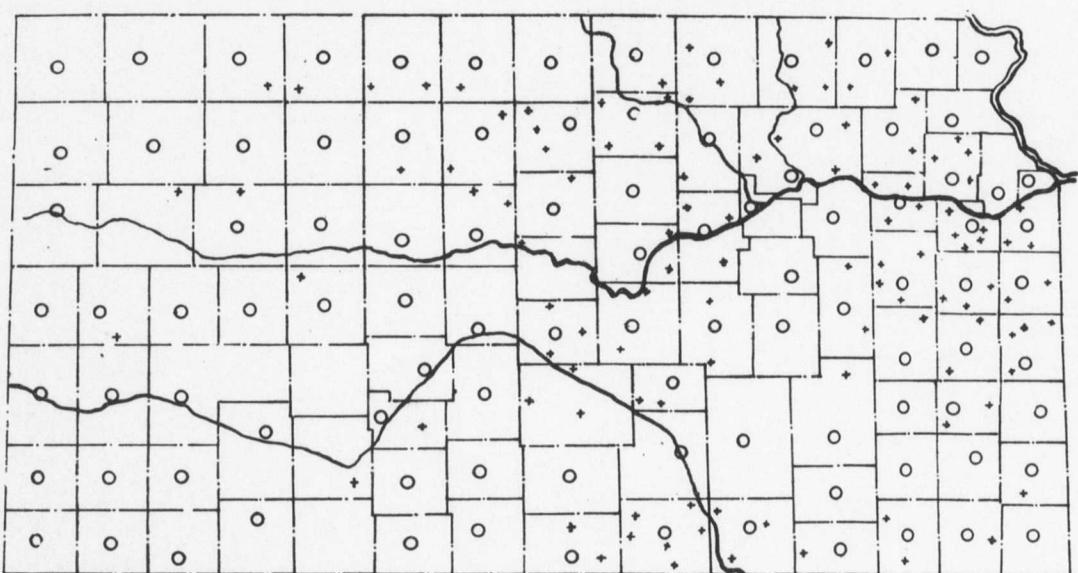
UNIVERSITIES AND AGRICULTURAL COLLEGES.

Illinois.....	3173	\$751,495	\$236
Minnesota.....	3647	606,713	166
Missouri.....	1637	395,411	242
Nebraska.....	2501	330,044	132
Ohio.....	1657	441,457	266
Wisconsin.....	2970	652,460	220
<b>Average.....</b>	<b>2598</b>	<b>529,597</b>	<b>204</b>
<b>General average.....</b>	<b>1508</b>	<b>291,530</b>	<b>194</b>

### ***Agricultural Education Away From College.***

The Kansas State Agricultural College has thirteen courses of study, six belonging to agriculture, five to mechanic arts, one to domestic science and art, and one to general science. In these courses it taught last year nearly twenty-two hundred men and women, nearly eighty per cent from the farms of Kansas. But for forty years it has been educating farmers who could not attend college. At the present time there are two hundred ten organized farmers' institutes with a total membership of over six thousand. Last year one hundred seventy-six institutes were held with a total attendance of nearly thirty-five thousand farmers. It has for three years conducted boys' corn contests with about five thousand boys each year—boys learning to grow corn according to the latest scientific knowledge. Bulletins and pamphlets to the number of nearly three hundred thousand copies have been mailed to farmers and boys by the several departments of the College.

FARMERS' INSTITUTE MAP OF KANSAS.



O = County organizations, 100. + = Local organizations, 110.

There are now 160,000 acres of planted trees in central Kansas, where at one time it was thought that trees could not be grown. As the area in which agricultural crops can be profitably grown is steadily extending, so the limit of forest planting and tree culture is widening always. The native timber in Kansas is also on the increase; prairie fires no longer sweep unchecked across the plains, and the strips of forest along the rivers and in the ravines and gullies are becoming broader every year.

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(Board of Instruction concluded on last page.)

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## *Triennial Address.*

(Alumni Association, June 17, 1908. By Ernest Fox Nichols, '88, Professor of Experimental Physics, Columbia University.)

Twenty years and a few days ago the class to which I belonged was graduated from College. It may justly be expected of one who thus comes back after so long an absence that he give some account of what he has done with the special training given him on this hillside. He should tell some of the good or bad uses he has made of his intellectual heritage. Partly, then, from a sense of duty, but more from the sheer pleasure of it, I want to speak of some of the things I have learned in twenty years' study of a fundamental science. I want to speak of the relation of discovery to invention; of the philosophical foundations of modern physics and some of its recent developments.

Scientific work attracts men of two distinct types of mind. One class seeks to understand nature, to discover her laws; the other to use her. In physics, more perhaps than in any other branch of natural science, is this line sharply drawn. The research student and investigator belong to the first group, their aim being to interpret and explain phenomena; the inventor and engineer to the second, their purpose to apply known laws and principles to the convenience, bodily comfort and safety of man. The investigator is not indifferent to human needs, but knows well that if he find out laws their utility may be better left to other hands than his.

This distinction in mental attitude is not an arbitrary nor artificial one, but real and thoroughgoing, for in the long history of physics we do not often find real ability for both discovery and invention united in the same individual, almost never the two talents developed to a prominent degree in the same man.

To ask which of the two, discoverer or inventor, has done more for the race and has better served mankind is an idle question; both, is the only possible answer. Without research and discovery great inventions become impossible, as there is nothing for the inventor to draw upon. "The discoverer sows the seed, the in-

ventor reaps the harvest." To illustrate: Oersted, in 1820, discovered the magnetic force around an electric current, and Ampere immediately worked out the laws governing the phenomena observed by Oersted. Later Morse, Wheatstone and others perfected instruments for applying these laws and invented the different systems of telegraphy still in use. Faraday, in 1830, made the great discovery of induced electric currents and stated the laws governing them. In accordance with the laws of Faraday, Gramme, Siemens, Edison and Brush constructed electric generators and motors and perfected systems of electric power production and lighting. The principles involved in the solution of all problems of electric power production and transmission go directly back to Faraday, as does also the principle of the Bell telephone.

In 1864 Maxwell worked out theoretically the properties of electric waves. Hertz, in 1887, discovered these waves in the laboratory and performed nearly all the known experiments in light with electric waves, and some other experiments which were only later done with light waves. Then came Marconi and others who carried out Hertz's experiments in a modified form and on a larger scale and accomplished the recent marvels of wireless telegraphy. Of Morse, Gramme, Edison, Brush, Bell, Marconi, from not one of these nor from all of them together have we gained one new law or principle. Our understanding of nature has not been extended by the labors of these men, great as they have been. Inventors have worked as patiently and untiringly as the men in pure science, and they have had as many obstacles to overcome and disappointments to live down. They richly deserve all the credit and fame they have had from a public which knows little of the difficulties and failures through which they have striven; but how often does the public think of Oersted, Ampere, Faraday, Maxwell, and Hertz, whose work, noticed only by a few, has made these great achievements possible?

Why had they no great inventors, physicians, engineers in the middle ages? If anything, they were more sorely needed then than now. Evidently public need alone will not produce such men unless research and discovery have gone before. There were no researches done in the middle ages; there was poverty, wretchedness, degradation and misery which only a knowledge of natural laws and intelligent application of them could have prevented.

We often hear from those that should know better that our greatest present need is for practical men, for engineers. There is no room in our age, they say, for the dreamer, the theorist, the

man with too much higher mathematics and unpractical ideas. But such were Oersted, Ampere, Faraday, Maxwell and Hertz in their day, and of such let us hope in some part is the Kingdom of Heaven. Should the work of research and discovery languish in our time, and no men of great ability be encouraged to take it up, then in the generation to which our children belong there will be neither great inventions nor epoch-making advances in engineering practice. The rule is inevitable—the *pure* science of one age is the *applied* science of the next.

It is doubtful if our understanding of the unity of external nature can ever be illuminated by the lamp of any one of the natural sciences. The division of nature into separate departments of study has been an intellectual necessity, caused by the greatness of the task. The easiest cleavage would separate the animate from the inanimate, the biological from the physical sciences. This cleft, the first to form, will be the last to close; for to define the precise relations of life to matter is now one of the most intricate and difficult problems in the whole range of human endeavor. Who will fundamentally answer the question, How does a seed become a tree?

The phenomena of inanimate matter are involved and complicated in the extreme, but those of living matter are even harder to understand. The outward or objective manifestations of life are of a material or physical character, and the purpose of the biologist is to apply to them the principles of physics and chemistry as far as these will carry him, and in many directions they have already carried him far. When, however, we consider the subjective phenomena of life, or consciousness, thought, and will, the question seems to me a metaphysical one, and we are without assurance that physics and chemistry can lead us beyond the boundaries of it. Indeed, just where physics and chemistry leave off, I feel a real and deeper problem begins. If so, the question lies at present beyond the reach of natural science, which biologist and physicist alike interpret as the science of matter and energy.

In what follows I shall try to review briefly the principal ideas upon which modern physics rests and shall say something about where we think we have arrived in our search for knowledge. I scarcely need to remind you that in the natural sciences, as in more practical affairs, *how* we have arrived is as important as *where* we have arrived, for the moment an inference or theory is doubted the evidence on which it rests must be gone over step by step and the earlier conclusion be approved or discarded in the

light of new knowledge. Here we come upon the chief reproach which the thoughtless urge against an assumed fickleness of natural science. They speak of past hypotheses and beliefs now abandoned by thoughtful men striving to interpret nature. But is it not more honorable and a method more worthy of confidence to let theories grow and change and evolve with increasing knowledge rather than to shut out new light with old shutters? Is it not better to constantly adjust theory to nature than essay the impossible and try to shrink nature into older molds of thought now plainly outgrown? We have seen enough and too much of this method in an even greater field of thought, and we are not yet done with the strife it has caused in the region of our deepest human interests.

In order to illustrate some of the processes of growth in physics I shall spend some time in presenting detached fragments of the experimental evidence and inferences upon which certain conclusions are based, hoping in this way to illustrate some of the constructive methods of reasoning employed in research.

The ideas which underlie all our thinking are space, time, and inertia or mass. With space and time as a background the physicist must pursue inertia and everything related to it along every conceivable path. In this pursuit he comes upon four ultimate though related conceptions: *Matter, ether, electricity, and energy*.

The historical development of these conceptions cannot even be sketched in such a lecture as this, but it should be remembered that an important part of our *present knowledge of matter and nearly all that we know of the ether and electricity has been gained not directly but by inference*.

In so many cases we see or know directly only the first and last link of a chain of events, and must search by indirect means for the mechanism lying between. At bottom, I suppose, the ether, electricity, molecule, atom, electron, are but the symbols of our groping thoughts created by an inborn necessity of the human mind which strives to make all things reasonable.

In thus reasoning from things seen and tangible to things unseen and intangible the resources of mathematical analysis are applied to the *mental images* of the investigator; images often suggested to him by his knowledge of the behavior of matter in the lump. This process leads first to a working *hypothesis*, which is then tested in all its conceivable consequences, and any phenomena not already known which it requires for its fulfilment are sought in the laboratory. By this slow advance a working hypothesis which has satisfied all the demands put upon it gradually becomes a *the-*

**ory**, which steadily gains in authority as more and more new lines of evidence converge upon it and confirm it.

If we now consider more closely the nature of the conception of *matter, ether, electricity* and *energy* we shall later find that matter, ether and electricity possess some attributes in common, and if we take careful heed to what we shall understand by the word, we may call them substances. Energy appears as the measure of their possible interactions.

Taking energy first. All the numberless changes we see taking place in the universe are, we think, manifestations of the interactions among matter, ether, and electricity. With every changing aspect of nature, energy is passing from body to body and undergoing incessant transformation, but its amount is always measurable by the work it may accomplish when harnessed. Our knowledge of the uncreatable and indestructible character of energy has given us a universal test which we may freely apply to all phenomena to prove our knowledge of them. For when the required energy relations are not satisfied by our explanations it means we have not got to the bottom of the thing, but must strike deeper in to realize the whole of the concealed mechanism.

Charmed by the simplicity and sweep of the law of the conservation of energy, a small school of physicists, who have mostly entered in by the door of physical chemistry, have frankly set energy before inertia and have endeavored to deduce matter and all else from it. This can, of course, be done, for physics has become a body of thought so closely knit together that all things in it are somehow related. Seen broadly, however, the new method has few obvious advantages over the historic procedure and not a few evident defects.

The indisputable hall-marks of matter—the two properties in the possession of which all the infinitely varied forms of matter unite—are *inertia* and *weight*. By inertia we mean that active resistance shown by every piece of matter to any effort to change its motion; while the mutual attraction between all material bodies, according to which all matter strives to collect itself into one huge compact lump, we call gravitation. The gravitational pull of the earth on a portion of matter is its weight. If we find anything in the world, however strange, which possesses both inertia and weight, we may call it matter without further examination.

The *ether*, evasive, intangible substance that it is, which surrounds and encloses all our universe, we first came to know as the bearer of waves of light and heat. Ever since that time we have known it to possess inertia, for no medium devoid of inertia can carry forward a wave motion. Thus the ether has inertia, one of the hall-

marks of matter. Has it also weight? This we cannot hope to know until we find some way as yet undiscovered to alter the normal quantity of ether in some restricted space. We must either get more of it or less of it than the usual amount in some walled receptacle, and this we do not yet know how to do. Here it should be remembered that the weight of gases was first proved when experiments of this kind were first made possible by the invention of the air pump and barometer. But alas, how shall we go about building an ether pump when all material walls seem more porous to the ether than the coarsest sieve is to air? And worse, the ether appears to be incompressible. The question of weight is thus at present in abeyance, and we leave it.

Of the properties of *electricity* alone it is still difficult to speak. The subject is easiest approached from the relation of *electricity* to *ether* on the one hand and the relations of *electricity* to *matter* on the other. It is in the relations of electricity to matter, the more complicated phase of our subject, that the most brilliant advances have recently been made.

To state the case between electricity and ether we must begin with Faraday and some of the mental images he formed of the connection between them, which have proved at once the most simple and useful aids to thought to be found in the whole history of physics. Faraday realized as well as perhaps we do to-day that electricity could no more be made outright than could be matter. The utmost which could be done was to separate positive and negative electricity. If, therefore, anyone exhibited a charge of positive electricity there was somewhere in the universe an equal negative charge to which it was drawn by invisible means across intervening space. Faraday maintained that the forces of attraction were due to some kind of strain in the ether lying between. To picture the more vividly to himself and to others the character of the stresses in the medium transmitting the force which one charge exerts upon another he imagined contractile filaments, called *lines of force*, to traverse the ether between the charges. To make the case more definite he gave direction to these lines, assuming that they originated on the positive charge and terminated on an equal negative charge nearby, or far away, according to circumstances.

The motion of electric charges when free to move and the stresses in the ether roundabout show that all happens as if each line of force were pulling like a stretched elastic thread to shorten itself and draw the charges together, and at the same time, unlike any elastic thread we know, it was repelling or pushing sidewise at the other force lines near it.

If a charge of positive electricity be given to a metal sphere and the negative charge from which it has been separated be dissipated to remove bodies, or be carried so far away that its position is no longer of any immediate importance, lines of force will start from the spherical surface of the metal in all outward directions and will be practically radial. As many lines will leave from any one-half of the sphere as from another. This equal radial arrangement of the lines of force is produced by the sidewise shoving of each line of force upon its neighbors until the stresses in the ether at the bounding surface of the metal are equal on all sides.

If now the metal sphere with its charge be put in steady motion it will carry its lines of force along with it and, if the motion be not too swift, all the lines of force will continue radial. But with this motion of the lines of force through the ether a wholly new and additional etherial force appears, a *magnetic* force, which did not exist when the charge was at rest.

As long as the motion and charge remain uniform there will be no change whatever in this magnetic force except that it keeps abreast of the sphere as do the lines of electric force on which it depends.

As soon as the motion ceases the magnetic force disappears, and soon all is as it was before the motion began. But while the sphere is *starting or stopping, before it has reached its steady motion* or *while it is coming to rest*, the electric and magnetic forces are undergoing readjustment, and this disturbance spreads outward through the ether with a speed precisely equal to the speed of light. Nor is this a chance agreement, for we now know that light consists of nothing more than very rapidly and periodically changing electro-magnetic forces travelling out through the ether from a *particular source of electric disturbance*, called a *luminous body*. Such, then, was Faraday's mental picture of the way electric charges grip fast hold of the ether. When charges tremble or quiver they set the ether trembling and quivering, and if the pulsations be only rapid enough to catch the eye, we see light.

To the mental images of Faraday—these lines of force which helped him to grapple with the unseen, to form working hypotheses, to experiment—to these Maxwell applied the powerful resources of mathematical analysis and reared the splendid structure of the electro-magnetic theory of light. Now that the work is done we may let fall the scaffolding which Faraday's vivid imagination supplied, but we could not earlier have done without it. Here, then, we have the whole chain, *mental image, hypothesis, experiment, theory*.

(To be continued.)

*Local Notes.*

Nearly 1700 students enrolled to date.

Manhattan is discussing the erection of another school building.

Professor Price is publishing a new edition of his American History Notes.

The Mechanical Department has installed its blower system in the new blacksmith shops.

The members of the Faculty will receive the seniors on Monday evening from eight to ten, October 26, in the Women's Gymnasium.

At the meeting of the Fifth District Federation of Women's clubs, held in Salina last week, Mrs. J. T. Willard was elected first vice-president.

Plans are on foot for a poultry show in Manhattan or at the College in December. There will be a meeting of the chicken fanciers next Thursday evening, when a date will be agreed upon.

On November 6 and 7 farmers' institutes will be held at the following places: Lawrence, Cottonwood Falls, Minneapolis, Alma, Clay Center, and Westmoreland. All but the last two are "first towns" on institute circuits.

The College team got its worst defeat for many years in the game played in the Manhattan Athletic Park last Monday afternoon. The Oklahoma University team played a really all-around good game, and the final score stood 33 to 4.

Custodian Lewis has replaced the seats in the chapel. The room is now being used every day for lectures in psychology and military science, and those who teach in it say that the rebuilding of the hall has greatly improved its acoustics.

Prof. C. H. Boice reports that the College battalion this fall term numbers over 500, exclusive of the military band. Two hundred new rifles were bought to supply the recruits and two additional companies, E and F, were organized. The captains chosen last week are: Co. A, Capt. G. C. Rexroad; Co. B, Capt. W. F. Droege; Co. C, Capt. D. A. Kratzer; Co. D, Capt. M. C. Sewell; Co. E, Capt. R. B. Nelson; Co. F, J. G. Lill; adjutant, A. H. Hanson.

The new Veterinary Hall is nearing completion, as far as the work of Contractor Henry Bennett is concerned. The stone work was finished last August; the roof, the windows and the plastering were added in September, and the finishing floors and stairs were laid this month. All that remains to be done is the inside varnishing, the construction of the raised seats in the large lecture room, and the hanging of the outside doors. The heating and plumbing will be done by the Mechanical Department of the College and the wiring for the electric lights by the Department of Electrical Engineering.

The grain-judging team that will represent the College at the National Corn Exposition at Omaha in December is hard at work training for the contest. The team that will be selected from those practising now will consist of five seniors.

The *Alumnus*, the official organ of the College Alumni Association, has changed editor. It is now being published by Miss Marcia Elizabeth Turner, '06. Number 1, volume VII, proves that the new editor knows how to edit a magazine. The pamphlet is full to the brim with interesting articles, reminiscences, and news items, and we predict for it a rapidly increasing circulation. Number 2 will appear next week.

#### ITEMS LEFT OVER FROM LAST WEEK.

Superintendent Miller and Miss Dow assisted last week in the following institutes: Wakefield, Clyde, Clifton, and Greenleaf.

Photographer Edward J. Davison, of Kansas City, took a panoramic view of the College campus last Saturday. The picture will be used as a frontispiece in the College year-book and the annual catalogue.

The Faculty, to the tune of nearly a hundred, posed for a group picture on the campus in front of Anderson Hall last Tuesday afternoon. The negative was taken with a panorama camera and is three feet long by ten inches high. The picture will be reduced and engraved for the next College year-book, but full-size plate photographs will be sold to all who desire to get copies.

The athletic team of the College won a game of football from the Salina Wesleyans on the Manhattan field a week ago last Saturday and lost a game to the Jayhawkers on McCook field at Lawrence last Saturday. The team is well organized and in first-class condition this fall and we know that it will score well. It will lose a game once in a while, but it will probably win the laurels for the season, as it did last year and the year before.

Dr. H. W. Wiley, chief of the Bureau of Chemistry of the United States Department of Agriculture, is chairman of the American committee of the Seventh International Congress of Applied Chemistry, which will be held in London from May 27 to June 2, 1909, and has appointed Professor Willard a member of the sub-committee of Section Seven, Agricultural Chemistry, of which Prof. C. G. Hopkins, of the University of Illinois, is chairman.

Prof. E. B. McCormick, of the College, was sent to Memphis, Tenn., last week by the good roads department of the government, to attend the Good Roads Convention held there. While employed in the department two years ago, Professor McCormick designed a testing machine for determining the amount of power required to pull a load over different kinds of roads, and he was called to Memphis to demonstrate the working of the machine. The machine owned by the government is to be kept at the Kansas State Agricultural College.—*Mercury*.

Professor TenEyck will go to Junction City on Saturday, October 24, to deliver an address on "Corn Growing" for the boys' corn-contest meeting. Mr. Cron will go down on Friday, October 23, to judge the corn, probably about two hundred entries.

Dr. Burton Rogers, of the Veterinary Science Department, has returned from Washington, D. C., where he attended the International Tuberculosis Congress and read a paper on "Ear-tagging Marketed Live Stock as a Means of Automatically Locating Dangerous Tuberculous Animals which Contaminate Milk, and of Economizing Eradication." The paper was well received and provoked much discussion.

Hon. J. L. Bristow, the republican candidate for the United States senate, spoke Friday morning, October 9, to the students after morning exercises. The big Auditorium was filled by students and town people to hear Mr. Bristow, who made a non-political talk. Mr. Bristow's theme was the complexity of modern civilization, and he illustrated his subject by comparing the advantages the young people of to-day enjoy with what their fathers and mothers could get. On account of this complexity of our civilization and the fact that the sovereign power lies with the voter, a great responsibility rests upon each one toward the government. Mr. Bristow talked for half an hour and was heard with profound attention.

The many friends of Prof. and Mrs. H. A. Wood were grieved to learn of his death, which occurred at Fargo, N. D., Saturday, October 3, from typhoid fever. Mrs. Wood will have the heartfelt sympathy of all who knew them. Professor Wood was an instructor in chemistry here for over two years and went to the North Dakota Agricultural College last January as assistant professor of chemistry. He had just gotten well into his work, which he found very congenial. Professor Wood was a graduate of Olivet College and had taken graduate work at Johns Hopkins University and the University of Michigan. He was especially strong in planning and conducting laboratory work, and his death will bring sadness to hundreds of students.

President Nichols announced from the chapel platform last Tuesday morning that the stock-judging team from the Kansas State Agricultural College won the Kansas City stock show trophy on Monday. Its score was 4285 points out of a possible 5200. Iowa Agricultural College, of Ames, was second, with 4158, and Missouri University third, with 4019. The Ames team won the cup last year. To retain the trophy permanently a team must win it three years in succession. Five men were on each team. The contest included the judging of three head of cattle, three horses, three mules, and three sheep. Prof. W. L. Carlyle, dean of the Colorado Agricultural College, was the judge who decided the event. The team representing the K. S. A. C. was composed of W. W. Hunt, H. E. Kiger, Ross Moorman, R. E. Hunt, and Wilbur McCampbell. W. W. Hunt won first money in the individual awards, C. W. McCampbell third, and R. E. Hunt fourth.

***Alumni and Former Students.***

Dora Harlan, '08, is now employed in the high school of Central City, Neb., as teacher of sciences.

C. C. Smith, '94, is back from the Pacific coast and is now connected with the *Nationalist* of this city.

Bessie Tolin, '08, is in charge of physical training and the domestic science work in a school in Marshall, Texas.

J. S. Montgomery, '07, will be assistant in animal husbandry to Dr. N. S. Mayo, in the Experiment Station at Santiago de las Vegas, Cuba.

Bertha Cowles, '05, is studying for the year at Fisk Deaconess Training School, Kansas City, Mo., and her address will be Cor. East Fifteenth and Denver Avenue.

A. E. Oman, '00, is now studying some commercial tree plantations in southern Kansas, and later will be employed in Oklahoma. His present address is Hutchinson, Kan.

Gertrude Lill, '07, is teaching mathematics in the schools of Council Grove, Kan., and Amy Elder, '08, is teaching ancient history, English and German in the same place.

H. A. McLenon, '08, and Miss Grace Tuley were married at the home of the latter, at Effingham, Kan., September 16. Mr. and Mrs. McLenon will be at home on a farm near Effingham.—*Students' Herald*.

Alma McRae, '06, returned to College to take up graduate work this fall, but received an appointment to teach domestic science in the Indian School at Flanderlau, S. D., and left here September 22 to take up her duties there.

Dr. J. W. Evans, '94, of Council Grove, Kan., after an absence of four or five years, made a rapid tour of the buildings with special reference to the new ones, a few days ago. He reports a successful practice of his profession.

Though considerably belated, these pages should not fail to record the promotion of Herbert F. Bergman, '05, to an assistant professorship in botany at the North Dakota Agricultural College, which he entered upon a few weeks ago.

Eva Alspaugh, '08, and Marion Zercher were married Thursday, September 17, at the home of the bride, in Lincolnville, Kan. They are at home at Lerado, Texas, where Mr. Zercher is joint superintendent for three express companies.

S. Faris, '06, has completed his apprenticeship with the Allis-Chalmers Co., Milwaukee, Wis., and is now working for it with an erecting gang at Kenosha, Wis., where he will be for several months. His address is 663 Pomeroy street.

Walter S. Wright, '06, has just assumed the duties of farmer at the Carson Indian School, Stewart, Nev. He writes that they have a very delightful mountain climate but the short seasons do not permit much results in an agricultural way.

Homer Derr, '00, 654 South Montana street, Butte, Mont., is teaching physics in the high school of that city, which he finds a very interesting one with a delightful climate and a splendid school system. He cannot get along without the INDUSTRIALIST.

Grace (Parker) Perry, '80, now resides at Salmon City, Idaho, where her husband, Geo. H. Perry, student in the seventies, is settled in the pastorate of the Presbyterian church. Their son, Geo. H. Jr., and daughter Anna have come to Manhattan to attend the College.

Kate Zimmerman, '00, is teaching in the high school at Sumpter, Ore. Sumpter is in a gold-mining district and surrounded by mountains covered with Oregon pine. Jeannetta Zimmerman, '91, and Maud Zimmerman, '02, are teaching again in Proctor Academy, Provo, Utah.

Dr. D. M. Campbell, former student, has been appointed to the office of milk and dairy inspector for Topeka under the new milk ordinance of that city. Mrs. Campbell, once Gertrude Hole, '06, visited here a few weeks before settling in their new home. Doctor Campbell expects to combine with his new duties a certain amount of practice in his profession as a veterinary surgeon.

Arthur T. Blain, '79, of Duarte, Cal., visited the College a few days ago for the first time in twenty-four years. It is of course practically a new institution to him, and he is likewise but little more than a stranger to those who knew him a quarter of a century ago. He has enjoyed a sufficient degree of prosperity and reports other of the former College students now resident in his region as doing well. Among these are George Keyes, Horace Jones, and Charles Stiles, former students, and Nellie (Cottrell) Stiles, '87.

Miss Georgiana West, who graduated from the State Agricultural College with the '07 class and was formerly one of Manhattan's most popular young women, was married in Eagle Pass, Tex., September 23, to Mr. George Allen. The wedding was very quiet, only members of the family being present. Mrs. Allen is the daughter of Mr. and Mrs. George West, now of Tampico, Mexico. Mr. Allen is a storekeeper at Tampico for the Mexican Central railroad, and the young people will make their home in that city.—*Republic*.

Perusal of the first copy of the *Alumnus* for the current year will impress upon the reader the impossibility of keeping track of the acts and fortunes of the alumni without an expenditure of far more time than is available to the alumni editor of the INDUSTRIALIST. Graduates and former students are again advised to subscribe for the *Alumnus* if they wish to keep informed concerning current history of the College family, and to be entertained by accounts of the happenings of earlier years. Miss Marcia Turner, '06, has shown in this first number under her editorship that the journal will not fall below the high standard set by Miss Hougham, '03.

Ethel Berry, '07, visited the College a few days on her return from a trip to LaFayette, Ind., where she had been in conference with the superintendent of farmers' institutes for Purdue University with reference to the institute work in domestic science which she will conduct in that state this winter.

Lieut. E. S. Adams [ '98], who has been stationed at Vancouver Barracks, is now at Fort Douglas Station, Salt Lake City, and writes to have his paper sent to that address. He has evidently lost none of his interest in the K. S. A. C., as he says, "If the paper has already been forwarded to Manila, I will thank you for a copy of the paper containing the account of the K. S. A. C.-K. U. football game."—*Republic*.

Concerning the class of 1908, we have information concerning the following: A. H. Wright is teaching sciences and agriculture in the schools of Lyons, Kan., Seneca Jones is doing similar work in the Norton County High School, Norton, and O. H. Gish is at Marysville in charge of mathematics, manual training, and agriculture. Louise Fleming is assistant principal of the Mankato schools and teaches English, history, and domestic art. Estella Ise is teaching in the Downs school, Charlotte Morton is teaching in the seventh and eighth grades of the Hill City school, and Esther Christensen, Cecile Graham and Edna Munger are teaching in the country schools of Riley county.

Prof. Robert W. Selvidge, of Columbia, Mo., and Miss Ivy Harner [ '93], of this city, were the principals in a quiet marriage which was solemnized at 9:30 o'clock Sunday morning at the home of the bride's parents, Mr. and Mrs. John Harner, 502 Osage. Rev. J. H. Lee performed the ceremony in the presence of the immediate family only. Professor and Mrs. Selvidge left on the 1 o'clock train for their home in Columbia, where the best wishes of many friends follow them. The bride is one of Manhattan's most popular young women, and her friends regret that her marriage will remove her from their midst. The groom is professor of mechanical engineering in the Columbia college and is an estimable young man.—*Republic*.

Changes of address: E. Jeannetta and L. Maud Zimmerman, Provo, Utah; Cecile Allentharp, '07, 704 South Jasper Avenue, Casey Ill.; S. Maud Smith, '04, 236 West Third Place, Chicago, Ill.; Edith E. Coffman, '06, Hayward Indian School, Hayward, Wis.; Geo. G. Goheen, '08, 3327 Armour Avenue, Chicago, Ill.; C. E. Davis, '06, 37 Arthur street, Schenectady, N. Y.; W. E. Thackrey, '96, Crow Agency, Mont.; Jane C. Tunnell, '89, 221 East Fifty-fourth street, Chicago, Ill.; Mabel (Crump) McCauley, '97, 6606 Monroe Avenue, Chicago, Ill.; W. F. Lawry, '00, 319 West Seventy-second, Chicago, Ill.; F. W. Christensen, '00, Box 710, Yale Station, New Haven, Conn.; H. C. Rushmore, '79, 2048 North Fifth street, Kansas City, Kan.; Kate (Oldham) Sisson, '92, 1546 Neil Avenue, Columbus, O.; E. H. Kern, '84, Coquille, Ore.; O. N. Blair, '04, 307 Market street, Portland, Ore.; L. W. Fielding, '05, Jonesboro, Ark.

*Board of Instruction (concluded).*

Miss Ada Rice, B. S. (K. S. A. C.)	Instructor in English
Miss Ella Weeks, A. B. (U. of K.)	Instructor in Drawing
Miss Daisy Zeininger, B. A. (Fairmount)	Instructor in Mathematics
Leonard W. Goss, D. V. M. (Ohio State University)	Instructor in Veterinary Science
Miss Ula M. Dow, B. S. (K. S. A. C.)	Instructor in Domestic Science
Theo. H. Scheffer, A. M. (Cornell University)	Instructor in Zoölogy
Herbert H. King, M. A. (Ewing College)	Instructor in Chemistry
John B. Whelan, M. A. (Nebraska)	Instructor in Chemistry
Louis H. Beall, A. B. (Denison)	Instructor in English
William L. House	Foreman of Carpenter Shop
Miss Gertrude Barnes	Assistant Librarian
Louis Wabnitz	Foreman of Machine Shops
Miss Ina E. Holroyd, B. S. (K. S. A. C.)	Assistant in Preparatory Department
Ambrose E. Ridenour, B. S. (K. S. A. C.)	Foreman of Foundry
Miss Emma J. Short	Assistant in Preparatory Department
Miss Ina Cowles, B. S. (K. S. A. C.)	Assistant in Domestic Art
Miss Kate Tinkey	Assistant Librarian
Earl N. Rodell, B. S. (K. S. A. C.)	Assistant in Printing
Roy A. Seaton, B. S. (K. S. A. C.)	Assistant in Mechanical Engineering
M. Francis Ahearn, B. S. (Mass. Ag. College)	Assistant in Horticulture
Miss Gertrude Stump, B. S. (K. S. A. C.)	Assistant in Domestic Art
M. Sheldon Brandt, Ph. B. (Yale)	Assistant in Architecture and Drawing
Chas. Yost	Assistant in Heat and Power Department
Earle B. Milliard	Foreman of Blacksmithing
J. T. Parker	Assistant in Woodwork
J. D. Magee, A. M. (Chicago)	Assistant in Mathematics
E. G. Meinzer, A. B. (Beloit)	Assistant in German
Miss Florence S. Latimer, B. M. (Ferry Hall Seminary)	Assistant in Music
Miss Marjorie Russell (Mechanics' Institute)	Assistant in Domestic Science
Burton Rogers, D. V. M. (Iowa State College)	Assistant in Veterinary Science
Miss Clara Willis (Framingham Normal)	Assistant in Domestic Science
C. O. Swanson, M. Agr. (Minn.)	Assistant Chemist, Experiment Station
Edw. C. Crowley, Ph. B. (Yale)	Assistant in Chemistry
Hugh Oliver	Assistant in Heat and Power Department
Miss Charlaine Furley, B. A. (Fairmount)	Assistant in English
Miss Jessie Reynolds, A. B. (U. of K.)	Assistant in Preparatory Department
Miss Mary F. Nesbit, A. B. (Illinois University)	Assistant in Mathematics
Miss Annette Leonard, A. B. (U. of K.)	Assistant in English
William C. Lane, B. S. (K. S. A. C.)	Assistant in Electrical Engineering
Miss Flora C. Knight, A. B. (Uni. of Wyoming)	Assistant in English
Miss Grace H. Woodward (Boston School of D. S.)	Assistant in Domestic Science
Miss Nellie Cave, B. M. (Univ. of Nebr.), (Chicago Music Coll.)	Assistant in Music
Miss Margaret Mack (K. S. N.)	Assistant in Preparatory Department
Edwin G. Schafer, B. S. (K. S. A. C.)	Assistant in Agronomy
Orin A. Stevens, B. S. (K. S. A. C.)	Assistant in Botany
Miss Mary W. Hancock (Mechanics' Inst.)	Assistant in Domestic Art
S. W. McGarrahan, A. M. (Grove City College)	Assistant in Mathematics
Carl G. Elling, B. S. (K. S. A. C.)	Assistant in Animal Husbandry
Kirk H. Logan, B. S. (U. of K.)	Assistant in Physics
C. A. Arthur Utt, B. S. (Cornell College)	Assistant in Chemistry
Miss Florence Warner, A. B. (Illinois University)	Assistant Librarian
Miss Anna Gordon, A. B. (Iowa College)	Assistant in Preparatory Department
Miss Bertha M. Johnston (Simmons College)	Assistant in Domestic Science
Harrison E. Porter, B. S. (K. S. A. C.)	Assistant in Mathematics
E. L. Sieber, A. B. (Indiana University)	Assistant in Chemistry
C. S. Knight, B. S. Agr. (U. of Wis.)	Assistant in Agronomy
Earle Brintnall, B. S. (Iowa State College)	Assistant in Dairy Husbandry
J. B. Parker, M. A. (Ohio State University)	Assistant in Entomology
Allen G. Philips, B. S. (K. S. A. C.)	Assistant in Poultry
Miss Gertrude Cannon, Bethany Col. and Oberlin Conservatory	Assistant in Music
Miss Bertha Bisby	Assistant in Preparatory Department
Fred M. Hayes, D. V. M. (K. S. A. C.)	Assistant in Veterinary Science
L. D. Bushnell, B. S. (Wisconsin)	Assistant in Bacteriology
Miss Bertha Donaldson (Chicago University)	Assistant in Domestic Art
Miss Elizabeth Putnam (Chicago Art Institute)	Assistant in Drawing
L. E. Petty, A. B. (Wabash College)	Assistant in Mathematics
Jules C. Cunningham, B. S. (K. S. A. C.)	Assistant in Horticulture
Miss Annie E. Lindsey (Simmons College)	Assistant in Domestic Science
K. W. Stouder, D. V. M. (Iowa State College)	Assistant in Veterinary Science
H. E. Kirby	Assistant in Printing
John E. Smith, B. S. (Oregon Ag. Col.)	Assistant in Botany
R. C. Wiley, B. S. (Oklahoma A. & M. College)	Assistant in Chemistry
D. Edmond Rudolph	Band Leader
Wm. A. Lamb	Poultryman
Floyd Howard	Farm Foreman

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**INDUSTRIALIST**

Historical Society

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# The Industrialist.

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(Board of Instruction concluded on last page.)

# THE INDUSTRIALIST

VOL. 35.

MANHATTAN, KAN., OCT. 31, 1908.

NO. 4

## ***Work of the Department of Entomology and Zoology.***

In response to a request from the editor of the INDUSTRIALIST for a statement of what the Department of Entomology and Zoölogy of the Kansas State Agricultural College is doing for the State, I submit the following brief outline.

During the present fall term this department is giving regular instruction in elementary zoölogy to 182 students in both class and laboratory work, besides teaching elementary geology to a class of 37 and systematic entomology to four special students. This means 30 hours of class instruction and 39 hours of laboratory exercise per week, besides the time occupied in preparation for class room and laboratory.

Throughout the year, but more especially during the growing season, many letters from farmers, fruit growers, millers and other citizens of the State, come to our desks every day, and some of these letters always require some investigation before answering. We regard personal correspondence as one of the best means of placing information where it is needed, and are always glad to give information to the man who is sufficiently in need of it to take the trouble to write us.

During the past year 1675 quarts of poisoned syrup for the destruction of prairie-dogs and gophers have been manufactured and sent out from the poison laboratory to the people of the State, and we are now accumulating a supply for the coming season.

We are continuing our study of the injurious mammals of the State, just now giving special attention to pocket-gophers and moles. Later it is planned to undertake the study of other injurious forms. This work is under the immediate charge of Mr. Scheffer.

For several years past the damage due to the work of corn ear-worm in corn has been so great and the commonly recommended means of combating so impracticable that a careful study of the question seemed imperative. Such a study has been carried forward during the past summer, and enough has been learned to in-

dicate some possibly successful methods of control, but these remain to be tested in the light of further study. We therefore plan to continue this work next year, at least.

From the time that the large number of Hessian-fly eggs found in September and October of last year on the young wheat showed that a year of destructive fly was at hand, this department has kept in close touch with the progress of infestation. During the winter the work necessary to keep in touch with the situation was performed by the regular department force, but in the spring Mr. Kelly, jointly representing the United States Bureau of Entomology and this department, located in the midst of the most seriously infested district in the State to study the "fly" and its work. In June, when Mr. Kelly's relation with us ceased, Mr. J. B. Parker, recently made assistant entomologist, took up the work and has carried it forward. Unfortunately, nothing practicable could be done to stop the work of the "fly" in the 1908 wheat crop. During the spring and early summer, we carried on a careful study of its life history to determine whether it varied essentially under our local conditions. In midsummer, when it became probable that this year's crop of wheat would also suffer from "fly" attack, we issued Press Bulletin No. 163, giving the best methods we knew for preventing the probable damage. We printed and distributed among the wheat growers of the State about 20,000 copies of this press bulletin. The measures of control advocated—early disking of stubble, later deep plowing, thorough destruction of volunteer wheat, and late sowing—have been shown by our studies this fall to have been fortunately chosen. Many farmers over the State are making a fight against the fly along this line. Of course, it is not impossible that the Hessian fly's predaceous and parasitic enemies, now working on it in considerable numbers, might so reduce it as to permit the early-sown wheat, even in infested districts, to make a good crop, but such a result is improbable. For the determination of the date when wheat may be sown to escape fly infestation in the northern, central, southern, eastern and western parts of the State, this department, in coöperation with a representative of the United States Bureau of Entomology, Mr. Kelly, and a number of up-to-date farmers, has instituted and is maintaining a double series of seven wheat-sowing experiments, one series extending from north to south in the eastern edge of the wheat belt and the other series paralleling it in the western edge. Three of these stations, two conducted by our experimental force and one by Mr. Kelly, are now being used to make a close study of the "fly"

emergence and oviposition with a view to discovering the best methods of treating the infested ground between harvest and seeding time, and to discovering a practicable method of determining when wheat may be sown to avoid the "fly." Mr. Parker has devoted his entire time during the late summer and fall to a detailed study of the Hessian fly and its parasites, to trying methods for treatment of ground between harvest and sowing time, and to testing practicable methods for determining when it is safe to sow the crop. Enough data have already been collected to convince us that such study may result in much good, and that it should be continued for at least another year.

So great became the stir over the work of the "green bug" during the spring of 1907 that this department felt called upon to look into and sift the matter as thoroughly as possible. Accordingly the study begun under Professor Popenoe during the spring of 1907 was enlarged and carried forward during last fall, winter, and spring. Last fall the "green bugs" were discovered seriously injuring the wheat in several fields in Leavenworth and Jefferson counties. The infested places were visited regularly throughout the winter, and in spite of ice and snow the bugs were found to pass that season as green lice on the wheat plants. With the coming of spring the attacks of predaceous and parasitic enemies quickly swept them from all localities except one, where they were finally plowed under. Late this summer they have been taken in small numbers in northern and southern parts of the State by Mr. Kelly. The "green-bug" problem is one for the final solution of which a most careful study of the effect of parasitic and predaceous enemies and of climatic conditions upon the insect's life history and habits is necessary. Our studies are yet far from complete, but enough facts have been gathered to show that the parasite is, under favorable weather conditions, a most effective check on the "green-bug;" that it can survive lower temperatures; that it can use several species of plant lice as food and is therefore unlikely to be absent from any locality in this State where the "green-bugs" are present in damaging numbers; that the destruction of volunteer wheat and oats, depriving the insect of some of its common summer food plants, will help to prevent it from infesting the regular crop, and that plowing under spots of seriously infested wheat is effective in preventing further spread from these spots. During most of the time this study and that of the corn ear-worm have been in progress, Mr. Dean has had charge of the detailed work.

The chinch-bug has received so much study in this and other states that we have not felt called upon to do anything with it, and have simply observed its habits and its work during the past summer. The lack of practical suggestions for the application of the general recommendation to destroy the chinch-bug in winter quarters, or so to clean up the farms that it will have no place to hibernate, has forcibly suggested that time might profitably be spent in a careful study of its wintering habits. We intend to prosecute such a study this coming winter in the hope of rendering more practicable present methods of destruction.

During the past year this department has endeavored to keep in touch with the advent of seriously injurious insects and to furnish, through the press of the State, knowledge of habits and methods of controlling the different species as the time for action arrived. We issued Press Bulletin No. 158 when the pocket-gopher injury had reached serious proportions; Press Bulletin No. 159 when it seemed that the "green bug" situation might become serious; Press Bulletin No. 161 when it seemed from the superabundance of chinch-bugs in wheat that serious injury might result to corn later in the season; Press Bulletin No. 163 when it seemed likely that the fly would seriously infest early sown and volunteer wheat this fall; Press Bulletin No. 165 when it was found that the greater wheat straw-worm had been responsible for large damage to wheat; and Press Bulletin No. 167 when the "weevil" began to do serious damage to grain in stack, bin, and granary.

Two regular bulletins have been published, one giving the results of several years' study of the pocket-gopher problem and the second recounting the life history, habits and methods of combating the mound-building prairie ant. The life history and habits of this species were published in 1903 in the "Transactions of the Kansas Academy of Science," but the work on remedial measures was completed only late last fall. Six press bulletins were issued during the past year at such times as the information seemed most needed.

As a member of the entomological commission it has been necessary for the head of this department to carry out his share of the annual nursery inspection and to study and devise means to control certain insects injurious to horticulture. As much has been accomplished in the latter as the limited funds would permit, and our part of the nursery inspection is now practically complete for this year.

T. J. HEADLEE.

**Farmers' Institute Schedule, October 20 to December 19.**

It has required considerable work on the part of the institute force to arrange for all these meetings, harmonizing dates, skipping sales, fairs, lyceum entertainments, etc., and it could not have been done had it not been for the patience and consideration of the various institute officers throughout the State. Only three committees have insisted on fixing their own dates, and to complete schedules around these three counties has caused much trouble. This will positively not be done again. I shall be glad to respect preferences, but it is unreasonable to expect me to inconvenience other committees and our speakers just to meet certain dates with only imaginary advantages. Some changes may be necessary even yet, but institute officers are urged to claim these dates at once in their newspapers. Remember that every change will probably mean extra traveling expense, and the institute fund is limited and it belongs to the farmers. Institute officers are urged to help make it go as far as possible. Twenty-six institutes were held from September 23 to October 14.

## CIRCUIT NO 1.

Tuesday, October 20, Flemings' Grove; P. E. Crabtree, L. E. Call.  
 Wednesday, October 21, Onaga; P. E. Crabtree, L. E. Call.  
 Thursday, October 22, Soldier; P. E. Crabtree, L. E. Call.  
 Friday, October 23, Meriden; P. E. Crabtree, L. E. Call.  
 Saturday, October 24, Overbrook, P. E. Crabtree, L. E. Call.  
 Monday, October 26, Quenemo, P. E. Crabtree, J. C. Kendall.  
 Tuesday, October 27, Admire; P. E. Crabtree, J. C. Kendall.  
 Wednesday and Thursday, October 28 and 29, Council Grove; P. E. Crabtree, J. C. Kendall.  
 Friday, October 30, Hope; P. E. Crabtree, J. C. Kendall.  
 Saturday, October 31, Gypsum; P. E. Crabtree, J. C. Kendall.

## CIRCUIT NO. 2.

Monday, October 26, Solomon; J. H. Miller, W. E. King.  
 Tuesday, October 27, Cawker City; J. H. Miller, W. E. King.  
 Wednesday, October 28, Excelsior; J. H. Miller, W. E. King.  
 Thursday, October 29, Jamestown; J. H. Miller, W. E. King.  
 Friday, October 30, Jewell; J. H. Miller, W. E. King.  
 Saturday, October 31, Formoso; J. H. Miller, W. E. King.

## CIRCUIT NO. 3.

Monday and Tuesday, November 9 and 10, Oskaloosa; Albert Dickens, R. J. Kinzer.  
 Wednesday and Thursday, November 11 and 12, Tonganoxie; Albert Dickens, R. J. Kinzer.  
 Friday and Saturday, November 13 and 14, Effingham; Albert Dickens, R. J. Kinzer.  
 Monday, November 16, Axtell; Albert Dickens, R. J. Kinzer.  
 Tuesday, November 17, Marysville; Albert Dickens, R. J. Kinzer.  
 Wednesday and Thursday, November 18 and 19, Washington; Albert Dickens, R. J. Kinzer.  
 Friday and Saturday, November 20 and 21, Belleville; Albert Dickens, R. J. Kinzer.  
 Tuesday and Wednesday, November 24 and 25, Blue Rapids; Albert Dickens, R. J. Kinzer.

## CIRCUIT NO. 4.

Friday and Saturday, November 6 and 7, Minneapolis; A. M. TenEyck, J. B. Parker.  
 Monday and Tuesday, November 9 and 10, Beloit; A. M. TenEyck, J. B. Parker.  
 Wednesday and Thursday, November 11 and 12, Stockton; A. M. TenEyck, J. B. Parker.  
 Friday and Saturday, November 13 and 14, Hill City; A. M. TenEyck, J. B. Parker.  
 Monday and Tuesday, November 16 and 17, Lincoln; A. M. TenEyck, J. B. Parker.  
 Wednesday and Thursday, November 18 and 19, Salina; A. M. TenEyck, J. B. Parker.  
 Friday and Saturday, November 20 and 21, Abilene; A. M. TenEyck, J. B. Parker.

## CIRCUIT NO. 5.

Friday and Saturday, November 6 and 7, Cottonwood Falls; G. C. Wheeler, T. J. Headlee.  
 Monday and Tuesday, November 9 and 10, Emporia; G. C. Wheeler, T. J. Headlee, Miss Dow.  
 Wednesday and Thursday, November 11 and 12, Newton; G. C. Wheeler, T. J. Headlee, Miss Dow.  
 Friday and Saturday, November 13 and 14, Wichita; G. C. Wheeler, T. J. Headlee, Miss Dow.  
 Monday and Tuesday, November 16 and 17, Kingman; G. C. Wheeler, T. J. Headlee, Miss Dow.  
 Wednesday and Thursday, November 18 and 19, Anthony; G. C. Wheeler, T. J. Headlee, Miss Dow.  
 Friday and Saturday, November 20 and 21, Wellington; G. C. Wheeler, T. J. Headlee, Miss Dow.  
 Monday, November 23, South Haven; G. C. Wheeler, Miss Dow.  
 Tuesday and Wednesday, November 24 and 25, Arkansas City; G. C. Wheeler, Miss Dow.  
 Friday and Saturday, November 27 and 28, Hackney; G. C. Wheeler, Miss Dow.

## CIRCUIT NO. 6.

Thursday, November 5, Montecello; P. E. Crabtree, J. C. Kendall.  
 Friday and Saturday, November 6 and 7, Lawrence; P. E. Crabtree, J. C. Kendall.  
 Monday and Tuesday, November 9 and 10, Olathe; P. E. Crabtree, J. C. Kendall.  
 Wednesday and Thursday, November 11 and 12, Paola; P. E. Crabtree, J. C. Kendall.  
 Friday and Saturday, November 13 and 14, Mound City; P. E. Crabtree, J. C. Kendall.  
 Monday and Tuesday, November 16 and 17, Moran; P. E. Crabtree, J. C. Kendall.  
 Wednesday and Thursday, November 18 and 19, Fort Scott; P. E. Crabtree, J. C. Kendall, J. G. Haney.  
 Friday and Saturday, November 20 and 21, Columbus; P. E. Crabtree, J. C. Kendall, J. G. Haney.

## CIRCUIT NO. 7.

Friday and Saturday, November 27 and 28, Mankato; J. H. Miller, G. A. Dean.  
 Monday and Tuesday, November 30 and December 1, Smith Center; J. H. Miller, G. A. Dean.  
 Wednesday and Thursday, December 2 and 3, Phillipsburg; J. H. Miller, G. A. Dean.  
 Friday and Saturday, December 4 and 5, Norton; J. H. Miller, G. A. Dean.  
 Monday and Tuesday, December 7 and 8, Hays; J. H. Miller, G. A. Dean, C. K. McClelland.  
 Wednesday and Thursday, December 9 and 10, Russell; J. H. Miller, G. A. Dean, C. K. McClelland.

Friday and Saturday, December 11 and 12, Ellsworth; J. H. Miller, G. A. Dean, C. K. McClelland.

## CIRCUIT NO. 8.

Monday, November 23, Cherokee; P. E. Crabtree, H. VanLeeuwen.

Tuesday and Wednesday, November 24 and 25, Girard; P. E. Crabtree, H. VanLeeuwen, J. G. Haney.

Friday and Saturday, November 27 and 28, Altamont; P. E. Crabtree, H. VanLeeuwen.

Monday and Tuesday, November 30 and December 1, Independence; P. E. Crabtree, H. VanLeeuwen, J. G. Haney.

Wednesday and Thursday, December 2 and 3, Erie; P. E. Crabtree, H. VanLeeuwen, J. G. Haney.

Friday and Saturday, December 4 and 5, Yates Center; P. E. Crabtree, H. VanLeeuwen.

## CIRCUIT NO. 9.

Friday and Saturday, November 27 and 28, Lyons; Albert Dickens, A. M. Ten Eyck.

Monday and Tuesday, November 30 and December 1, Great Bend; Albert Dickens, A. M. Ten Eyck.

Wednesday and Thursday, December 2 and 3, Larned; Albert Dickens, A. M. Ten Eyck.

Friday and Saturday, December 4 and 5, Kinsley; Albert Dickens, A. M. Ten Eyck.

Monday and Tuesday, December 7 and 8, St. John; Albert Dickens, A. M. Ten Eyck.

Wednesday and Thursday, December 9 and 10, McPherson; Albert Dickens, A. M. Ten Eyck.

Friday and Saturday, December 11 and 12, open dates.

## CIRCUIT NO. 10.

Monday and Tuesday, December 7 and 8, Eureka; P. E. Crabtree, J. C. Kendall.

Wednesday and Thursday, December 9 and 10, Garnett; P. E. Crabtree, J. C. Kendall.

Friday and Saturday, December 11 and 12, Burlington; P. E. Crabtree, J. C. Kendall.

Monday and Tuesday, December 14 and 15, Ottawa; P. E. Crabtree, J. C. Kendall, J. H. Miller, Miss Dow.

Tuesday and Wednesday, December 15 and 16, Lyndon; P. E. Crabtree, J. C. Kendall, J. H. Miller, Miss Dow.

Wednesday and Thursday, December 16 and 17, Holton; P. E. Crabtree, J. C. Kendall, R. J. Kinzer.

Thursday and Friday, December 17 and 18, Hiawatha; P. E. Crabtree, Miss Dow.

Friday, December 18, Troy; P. E. Crabtree.

## SPECIAL TRIP INSTITUTES.

Friday, October 30, Wamego; A. M. Ten Eyck.

Saturday, October 31, Rossville; A. M. Ten Eyck.

Friday and Saturday, November 6 and 7, Alma; J. T. Willard, R. J. Kinzer.

Friday and Saturday, November 6 and 7, Westmoreland; J. H. Miller, L. E. Call.

Friday and Saturday, November 6 and 7, Clay Center; A. Dickens, F. S. Schoenleber.

Friday and Saturday, November 27 and 28, Manhattan; T. J. Headlee, J. C. Kendall, Mrs. Van Zile, L. E. Call.

Friday and Saturday, November 27 and 28, Topeka; T. J. Headlee, Edwin Taylor.

No other institutes can be held until after January 1, 1909, unless they can be dated to fit into a "broken circuit," or November 9 to 15, November 23 and 24, and December 14 and 17.

## THE WINTER CIRCUIT.

The winter circuit will begin on January 11 or 18 and continue until March 13 or 20, the itinerary to be announced about January 5, following the State Farmers' Institute, to be held December 28 to January 2.

Institute officers or public-spirited men who want to have institutes this fall in connection with any of the broken circuits should write at once. Correspondence relative to the winter circuits should not be deferred much beyond the first of December.

Address all correspondence to

J. H. MILLER,

MANHATTAN, KAN., Oct. 22, 1908. *Supt. Farmers' Institutes.*

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D. Edmund Rudolph, the newly elected leader of the cadet band, is a native of Ohio. He studied theory, harmony and composition under Dr. H. R. Palmer, of New York City, Prof. Otto Singer, of Cincinnati, O., and Dr. Hugh A. Clark, of Philadelphia. In voice culture he was a pupil of Prof. J. Harry Wheeler, of New York City, and Prof. W. S. Sterling, of Cincinnati, O., and studied piano and band instruments in the well-known Cincinnati College of Music. He began the study of music at the age of seven. At the age of fifteen he won a prize as conductor of chorus in contest with seven other chorus organizations. He was leader of a band at the age of eighteen and has since been continuously engaged in band, orchestra, chorus and choir work. Leaving a better position, financially, in Ohio, he came to Manhattan on account of the health of his youngest daughter. He has taken hold of the College Military Band like one who knows what can and ought to be accomplished, and we have no doubt of his ability to make it a perfect success.

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The junior member of West & Co., the firm that is building the Manhattan electric railway, tells the local editor that the route from the Union Pacific depot to College will pass up Second street to Poyntz Avenue, then west to Ninth street, then north to Fremont street, then west to the Y. M. C. A. building, then north to Vattier street, then west to the main campus entrance, then north and west to the College barn and the engineering shops, then south past Baxter's greenhouse down to Poyntz Avenue and two blocks beyond, then east along Pierre street to the point of beginning. Another spur will leave Poyntz Avenue at the court-house and go north to Vattier street, then west past the Athletic Park to Eleventh street, where it will connect with the main line.

**Local Notes.**

The cadet band, under the leadership of Director D. E. Rudolph, is making rapid progress. They had several marching drills on the campus this week.

President Nichols was at Emporia Friday and Saturday of last week attending the annual meeting of the city superintendents of the cities of the first and second class.

The football game in the Manhattan Athletic Park, between the Agricultural College and Winfield College last Tuesday afternoon, was easily won by our team. The score stood 17 to 0.

The Mechanical Department is very busy with the construction of the heating and plumbing system of the new Domestic Science and Art Hall. It is hoped that this work can be completed before the cold weather sets in.

The total registration of Manhattan city this fall is 1349. By the usual process of figuring population, multiplying the number of voters by five, the city would now have 6750 inhabitants, not counting the 1700 students.

The College office of the *Students' Herald* has been moved into the former office of Superintendent Rickman, in the basement of Anderson Hall. The paper will be printed in the print-shop of the Manhattan *Nationalist* this year.

The building of the addition to the boarding hall at the Hays Branch Experiment Station was let last Monday to A. M. Barnard, a former student of the College. The addition provides for a large porch, a room for the cook, two large bedrooms, and the extension of the dining-room and the kitchen. It will cost about \$1500.

Prof. W. C. Hoad, of the civil engineering department of the State University, visited College last Wednesday. He spent the whole forenoon, accompanied by Professors Walters and Willard, inspecting the different departments and seemed to be especially interested in the domestic science laboratories, the printing-office, and the shops.

The United States Civil Service Commission announces an examination of candidates for two assistants in agricultural education in the Office of Experiment Stations, Department of Agriculture, at salaries from \$1400 to \$1800 per annum. The duties of the positions will be performed chiefly at Washington, but there will be occasional work outside of the Capital, such as attending conferences, giving addresses at public meetings, etc. Competitors will not be assembled for the tests but will be asked to account in the subjects of (1) undergraduate education, (2) post-graduate training and practical experience, (3) thesis and publications. Applicants will apply for special blanks and application forms to United States Civil Service Commission, Washington, D. C. The time limit for presenting applications and other documents is November 19, 1908.

The contractors of the new engineering building are getting along nicely. The foundations are nearly finished. All the walls and piers below the level of the main floor are constructed of rich concrete, consisting of Portland cement, Blue river sand, and broken rock.

The amount of city water consumed in Manhattan is increasing from month to month. The water-works commissioner reports that over 6,000,000 gallons were consumed from the 15th of September to the 15th of October, and that he made 17 new residence taps. None of this water was used by the College.

The faculty-senior reception last Monday night in the Women's Gymnasium was an elaborate function. The local editor regrets that on account of his absence from the city he cannot speak of the program from his own observations. This is what the *Republic* reports: "Prof. Albert Dickens and Mrs. Mary Van Zile, who had charge of the decorations, left nothing undone which would add to the beauty of the building. The class colors, brown and pink, were carried out with artistic effect. Shocks of Kafir-corn tied with pink ribbon were placed in the windows and about the rooms, and field corn and pink bunting were also used lavishly in the decorative scheme. A large American flag was draped in a conspicuous place and the figures '09 were carved in a brilliantly lighted pumpkin. The scene was a particularly pretty one. Mr. Martin and Miss Harrison introduced the members of their class to the Faculty, about one hundred of the members being in attendance. Music was furnished throughout the evening and refreshments of hot cocoa, punch and wafers were served. Mrs. Brown and Miss Becker presided at the punch bowl and Mrs. McCormick and Mrs. Schoenleber served the cocoa. The affair was thoroughly enjoyed by all who participated in it."

Dr. K. W. Stouder, the newly elected assistant in veterinary science in this College, is a native of Iowa. He attended and graduated from the public-school system of the city of Des Moines. Later he spent a year pursuing the course in agriculture and animal husbandry at the Iowa State College, because at that time no course in animal husbandry was offered to veterinary students. After this work was finished he matriculated as a veterinary student and graduated from the department of veterinary science in the same institution. After graduation he was employed in the Bureau of Animal Industry as a federal veterinary inspector, but soon resigned this position to enter the services for surgeon and anatomist to the state college of Washington, where he eventually reached the chair of professor of surgery and anatomy and assistant to the state veterinarian. He was head clinician during the three years spent in this office and frequently filled the position of acting state veterinarian, enforcing the strict live-stock sanitary laws of the state of Washington. In August of this year he was elected to the chair of assistant in veterinary science at Manhattan. Doctor Stouder is an experienced and energetic young scientist who will undoubtedly contribute much to make the veterinary course at this College a success.

***Alumni and Former Students.***

Maud Hart, '01, is matron of a Presbyterian Mission School for boys at Albuquerque, N. M.

Dr. J. W. Fields, '03, and Edith (Felton) Fields, of McPherson, have a little daughter, born within the month.—*The Alumnus*.

James Garver, '07, is in the insurance business in Grand Forks, N. D., at present. He plans to spend the winter in the East, after which he will settle down to raising fine stock in partnership with his father at Abilene, Kan.—*The Alumnus*.

W. E. Mathewson, '01, of the Bureau of Chemistry, U. S. Department of Agriculture, has been transferred from the Chicago to the New York laboratories. His address is now U. S. Food and Drug Laboratory, Appraisers Stores, New York City.

Grover Kahl, '07, and Miss Anna Toothaker, student last year, were married Wednesday, October 28, at the home of the bride near Westmoreland. They will reside in Schenectady, N. Y., where Mr. Kahl has an excellent position with the General Electric Company.

A. C. Cobb, '88, Wagoner, Okla., has been elected a member of the board of agriculture of that state, which is also the board of regents for the agricultural college and experiment station. The board is elected by delegates from the farmers' institute organizations of the state.

Alice Loomis, '04, 417 West One hundred twenty-first street, New York City, in requesting a catalogue adds: "I was quite proud to hear an instructor say recently that New York City, Boston and the Kansas Agricultural College were the first three centers of domestic science in the United States."

S. W. Williston, '72, professor of paleontology in the University of Chicago, has just returned from a very successful expedition into Texas for the purpose of collecting fossils, and stopped for a few days to visit relatives and the College. He sees for us in the future one of the greatest technological institutions in the land.

The friends of Dr. M. F. Hulett, '93, will regret to hear that Mrs. Hulett died on the 13th of July. She had apparently recovered from an attack of pneumonia, which had, however, sapped her reserve vitality, and succumbed to an involvement of the heart. Doctor Hulett is left with the care of five children from one and one-half to eleven and one-half years of age.

A wedding which comes as a surprise to her many Manhattan friends is that of Miss Jessie Sweet ['05] to Rev. George Arnold, of Dousman, Wis. The marriage took place in Chicago Wednesday morning, October 21, but no details have yet been learned. Reverend Arnold is pastor of the Presbyterian church at Dousman and his bride is one of Manhattan's accomplished young women. She is a daughter of Mr. and Mrs. B. F. Sweet, of 816 Pierre street. The best wishes of scores of friends will follow her to her new home in Wisconsin.—*Republic*.

Kansas State Agricultural College  
Manhattan, Kansas

## State Farmers' Institute

December 28, '08, to January 2, '09

Stock and Stock Judging  
Corn and Corn Judging  
Poultry and Poultry Judging  
Dairy and Dairy Testing  
Cooking and Sewing

8 to 12 a. m. and 1 to 2:30 p. m., Judging, Demonstrations  
and Drill  
2:30 to 5:00 and 7:30 to 10:00 p. m., Lectures

OPEN TO ALL! NO FEE! BOARD REASONABLE!

Fine Exhibit of Draft Horses, Beef Cattle,  
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Sessions begin at 8 a. m., 1 p. m., and 7:30 p. m.

For further particulars address  
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## Kansas State Agricultural College

Manhattan, Kansas

## State Farmers' Institute

and

## Allied Conventions

December 28, '08, to January 2, '09

Kansas Boys' Corn Contest Association  
Kansas Corn Breeders' Association  
Poland-China Breeders' Association  
Duroc-Jersey Breeders' Association  
Berkshire Breeders' Association  
Kansas Draft-Horse Breeders' Association  
Institute Officers' Conference  
Cattle Breeders' Conference  
Kansas Butter-Makers' Convention

**A Strong Program Every Afternoon and Evening**

Institute begins December 28 and ends January 2  
Come for the First Day and Stay for the Week

**Special Speakers.** All of the speakers for the State Farmers' Institute have not yet been secured, but Supt. J. H. Miller announces now the following list: Ed. H. Webster, W. J. Spilman and A. D. Shamel from the Department at Washington; Prof. H. R. Smith, of the University of Nebraska, Prof. W. J. Fraser and Prof. Wm. Dietrich, of the University of Illinois, Prof. B. F. Mumford, of the University of Missouri. The institute will convene at 2:30 Monday afternoon, December 28, and adjourn at noon on Saturday, January 2.

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Historical Society

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(Board of Instruction concluded on last page.)

# THE INDUSTRIALIST

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MANHATTAN, KAN., Nov. 7, 1908.

No. 5

## *Triennial Address.*

(Alumni Association, Kansas State Agricultural College, June 17, 1908. By Ernest Fox Nichols, '88, Professor of Experimental Physics, Columbia University.)

(Concluded from issue of October 24, 1908.)

As we now take up what we believe to be the connections between *electricity* and *matter* we come in places upon slippery ground and the bases of our faith rest on recent foundations. At the outset we encounter one striking difference between electricity and matter. Every free charge of electricity exerts a force upon every other charge in the universe, just as every particle of matter exerts a force on every other particle of matter, however distant. But with matter the particles are invariably urged toward each other, while electric charges may be either drawn together or forced apart, depending on the kinds of charges. We have both positive and negative electricity, but only one kind of matter.

Positive and negative electricity differ in some ways as right- and left-handed things differ. If the same number of right- and left-handed turns be given to a screw, one hand will precisely undo the work of the other. If the right and left hands be brought together they fit part for part, but two right gloves make a sorry pair, and so do two like charges of electricity. On the contrary, there is no right and left to gravitation. Two pieces of matter always fit in the gravitational sense. Further, the force of attraction or repulsion between two charges of electricity is diminished by filling the space between them with oil, glass, sulphur, or any other solid or liquid substance, but the force of gravitation between two bodies is the same as long as the distance is constant, and masses between are powerless to *shield* or to *alter* it. Although the bald statements of the laws of gravitation and electric force bear a strong resemblance to each other, the laws tell us only how the forces *vary* but reveal no hint of the machinery by which they *act*.

Gravitation was the first force man encountered, and it is still the one he knows least about, for we have got no further than

where Newton left it two and a half centuries ago. We have some inkling of the possible machinery by which one electric charge acts upon another at a distance, and we feel nearly as sure that the pull or push is carried by the ether as that the pull of a horse on a cart is through the traces which bind him to it. With gravitation the case is very different, for we haven't as yet the slightest valid conception of *how* the pull of one mass upon another is conducted across the intervening space, nor *what* conducts it. We can get no further until the speed with which gravitational disturbances travel from body to body has been measured, and no one at present seems to know how to go about making such an experiment. To make a gravitational disturbance adequate to the purpose would prove a grave undertaking indeed. Thus gravitation is still unconnected, unattached to anything else in nature; as independent as Mr. Kipling's "cat that walked by himself, and all places were alike to him." It is still the stumbling-block to the physicist which it has been these many years. How can he explain a universe when he is unable to give a reasonable account of the cement which holds it together?

Of the intimate association of electricity with matter we have learned much from careful study of the processes by which electricity is carried through solutions and gases. When a simple chemical compound (and it should be borne in mind that the molecule or smallest unit of a compound is built up of atoms of at least two different kinds)—when a simple chemical compound, hydrochloric acid for example, is dissolved in water and an electric current is passed through the solution, the products hydrogen and chlorine of the decomposed acid appear in definite proportions at the points where the current enters and leaves the liquid—the chlorine where the current enters, the hydrogen where it leaves. We know this current to consist of processions of *single charged atoms*, a disorderly march perhaps with a crowd of idle bystanders obstructing the way, but the movement is always forward, each constituent of the broken molecule carrying a definite electric charge. These processions are always double, the atomic carriers of the positive charge (hydrogen) moving in one direction, those carrying the negative charge (chlorine) in the other. The same quantity of positive electricity is carried by one procession as negative electricity by the other. We have not only measured the charge carried by a single atom, but also the average speed with which the atoms traverse the solution. It has been found further that the atoms of the different material elements having the same mating value (technically called valence) always carry

the same unvarying charge of electricity, whether the atoms themselves be heavy or light. These charged atoms, in some cases atom groups, are spoken of as *ions*.

Such electrolytic experiments as these have led to two surprising results: First, *no electric charge smaller than that carried by an atom of the hydrogen valence has as yet been found*. Second, *all other small charges are exact multiples of this value*. We have long been familiar with the idea of atoms of matter, but here for the first time we come across something which looks very like an atom, or a natural unit, of electricity. The justification for calling it an atom of electricity is like the argument for the atom of matter. Moreover, we know some eighty different kinds of material atoms but only two kinds of electric atoms, a positive and a negative. Thus the electric atom of the two has the greater claim to simplicity. When we speak of an electric atom, disregarding for the time the matter associated with it, we call it not an *ion*, but an *electron*. Evidence will later be given suggesting ways by which we may wrench a negative electron wholly free from matter and experiment with it in its pure and undefiled state.

We are now in a position to consider the role electric forces play in holding atoms together within the molecule, for from the foregoing it appears when a molecule of our acid, for instance, is broken in two the fragments are always found equally and oppositely charged, and they doubtless hold these charges within the molecule. It seems probable, therefore, that the electric force between the atoms of matter in the molecule supplies the chemist with the cement he has long called *chemical affinity*.

The ratio of the electric charge to the mass of the particle on which it rides (in our processions) has lately come to be one of the most important quantities in physics. As we know both the quantity of matter and electricity transferred by a given electric current, we can express this ratio for each chemical element. Hydrogen gives the largest ratio found in solutions.

Systematic study of the conduction of electricity in gases is of more recent origin, but the knowledge gained not only confirms the ideas formed to explain conduction in solutions, but has very widely extended and simplified them. The chief difference between electric conduction in solutions and conduction in gases arises from the large number of broken molecules or ions always present in solutions. These require only the presence of an electric force to start them marching, but a gas, in its natural or non-conducting state, contains very few ions, not enough to support even a very small current, and for this reason gases are insula-

tors. In gases, however, there are many ways of making ions, X-rays, radium rays, rays of ultra violet light on metals, combustion in flames, white hot bodies of every sort will do it. But there is one method which depends on the violent collision of ions with molecules which is so objective in its form I cannot forbear attempting to describe it. It is also the method which leads us to cathode rays and much more.

Imagine, then, a glass tube into each end of which a conducting rod carrying a small metal disc is sealed. These rods may at will be connected to the terminals of a battery. If, while the tube is filled with a gas, in its non-conducting state the battery be applied, the very few ions always present are set in motion, but the too frequent collisions in the swarm of inert molecules which obstruct the way prevent the moving ions from attaining more than moderate speeds. By connecting the tube to an air-pump, as many as we like of the interfering molecules may be removed. As more and more gas is drawn out of the tube the moving ions encounter fewer and fewer collisions, and in consequence attain higher and higher speeds, as small shot might fall through a gradually dispersing swarm of bees poised in mid-air. The longer the pumping is kept up the greater the maximum speed of the ions becomes and the more violent are the collisions which do occur. When nearly all of the gas has been drawn out of the tube a stage is reached where the encounters between flying ion and indifferent molecule become so violent that molecules are shattered and new ions produced which in their turn work more destruction.

When this stage is reached the gas is a good conductor of electricity, but if the pumping be carried too far a second stage appears in which the encounters are too few to make enough new ions to support the current, and the gas finally ceases to conduct systematically. It is near the end of the conducting stage that the much-discussed cathode rays appear. They depart from the cathode or metal disk in the end of the tube connected to the negative side of the battery.

The extraordinary resourcefulness shown by the leading workers in this recent field of enquiry in untangling the complex snarl of phenomena presented marks a very great achievement. So inspiring from the human side as well as the physical has been this unequal contest of man with nature, of mind struggling against disorder, and so bravely done, that I ask your indulgence while I try for a few minutes, fragmentarily, to describe one or two fundamental experiments.

Cathode rays are invisible, but many substances (fortunately

glass is one of the number) shine with a bright phosphorescent light when placed in the path of the rays. By this means it was early discovered that cathode rays travel in straight lines, which always leave the cathode making right-angles with the metal surface from which they depart. It is possible, therefore, to make the cathode concave or saucer-shaped and thus bring the rays to a focus at some point in the tube. If cathode rays are thus focused upon the blades of a very delicate paddle-wheel which rotates easily upon an axle, the wheel is set revolving as if struck by a stream of moving matter. These rays are found to possess an unusual power of penetrating matter impervious to light. They will even traverse a considerable thickness of aluminum. A comparison of the absorbing powers of different materials for cathode rays shows absorption to be roughly proportional to the density of the substance. There is a field of magnetic force about a beam of these rays, and this added to the transfer of electricity along the path gives to the cathode stream the distinguishing marks of a procession of electrically charged bodies.

If a magnet be brought near the tube, the cathode stream is deflected from its direct course. This deflection by the magnet shows three things: First, cathode rays are not of the nature of light rays, the path of which a magnet is powerless to change. Second, the curved path which the stream follows again shows the stream to possess inertia. Third, the side to which the rays are deflected indicates a stream of negative electricity. Strongly electrified bodies brought near the tube also deflect the rays. It is possible to determine the speed and the ratio of the charge to the mass of the cathode particle by measurements of the curvature of the path due to the combined magnetic and electrostatic deflections.

Speed as high as one-tenth the velocity of light, or 100,000 times the speed of a modern rifle bullet, have thus been observed, and the ratio of electric charge to mass comes out nearly a thousand times that found for the hydrogen atom in solutions. If, then, the charge on the cathode particle is no larger than that on the hydrogen atom, which was called an atom of electricity, then the inertia or mass of these particles is only one-thousandth part of the mass of the hydrogen atom.

The nature of cathode rays was thus determined, but at this stage it was all important to catch a known number of these missiles and measure the electric charge each carried. As the estimated size of these minute bodies is less than one ten-million-millionths of an inch, direct counting would be both slow and difficult.

To realize how slow and how difficult one must remember that a bacillus is as much larger than an electron as the earth is larger than a bacillus. Yet by one of the most ingenious experiments ever performed Prof. J. J. Thomson caught a known number of cathode particles and measured the combined electric charge.

The charge Professor Thomson found as the result of his brilliant experiment was the atom of electricity over again. After this it was impossible to escape the conclusion that the bodies flying in the cathode stream were masses no greater than the one one-thousandth part of the hydrogen atom. Thus matter, or electricity, or something exists which measured by inertia is a thousand times smaller than the lightest known atom of matter. Furthermore, the kind of gas in which the cathode discharge took place had no effect upon either the charge or the mass of the particles, which bear no observable earmarks to reveal the kind of matter out of which they come. Whatever their source, they are always the same. So far as we now know the cathode particle, or negative electron, is a minute portion of negative electricity wholly free from matter—an atom of electricity, and nothing more. Its small inertia can be wholly explained to be of the kind electric charges borrow from the ether which surrounds them.

When electrons driven at high speed down the cathode stream are suddenly stopped by striking a target of dense matter like platinum, the point where the target is struck becomes a source of X-rays. We have already seen that a moving electric charge when brought to rest sends out a pulse of electro-magnetic disturbance in the surrounding ether, and the greater the suddenness with which the motion is arrested the sharper and more abrupt is the shock to the ether. Thus in one sense the principal difference between X-rays and the yellow light from a sodium flame is analogous to the difference between the air disturbance caused by an irregular jumble of sharp, thin reports of small percussion caps and the droning of a heavy organ pipe. One is a tangle of single shocks, the other a steady wave motion. Thus regarded, nearly all the remarkable properties of X-rays find a reasonable and easy explanation.

Turning now to the positive terminal of the tube: Under suitable conditions of experiment it is possible to get a stream of particles from it. Named as children are before their natures are in the least understood, these rays were called *canal rays*. Like cathode rays, they consist of flying missiles, but carry positive instead of negative charges. Compared with cathode rays their speed is very moderate and the ratio of charge to mass is of the

same order as that for the lighter atoms in conduction through solutions. This ratio varies somewhat with the kind of gas in the tube. Thus canal rays are probably a stream of material atoms which have lost one or more negative electrons. All efforts to obtain a charge of positive electricity free from matter, a veritable positive electron, have thus far failed.

The extreme complexity of structure of the material atom is strikingly shown by the light from incandescent gases and vapors. When the shining vapor of iron is examined by the spectroscope, hundreds of definitely placed bright lines appear in the visible spectrom alone. This means that the iron atom must be capable of vibrating in hundreds of different periods. No single atom need be vibrating in all these ways at the same instant, but if all iron atoms are alike, and we have every reason to believe they are, whether shining on earth or in the stars, then every atom of iron must be capable of swinging or bounding, revolving and shuddering, or doing something in all these ways.

Before the evidence of the spectroscope the older idea of the atom as a simple structureless body falls to the ground. The complexity of a grand piano seems simple in comparison with the iron atom. But the spectroscopic evidence does not end here, but indicates *what* it is in the atom which *does something* and *how* it does it.

Ten years ago Professor Zeeman placed a sodium flame between the poles of a powerful electro-magnet and examined its light by the spectroscope. He observed the most striking and peculiar effects of the magnetic force on the character of the light. The time is too far gone to permit a description of what the effects were, but the light sent out by the flame showed exactly the characteristics which magnetic force would produce provided the light came from atoms inside which minute electric charges were rapidly revolving. It was even possible to compute the ratio of charge to mass for these revolving mites. The ratio revealed was that previously obtained for the cathode particle.

Hence the mechanism which enables the material atom to emit light is the same electron we met flying through the vacuum tube, now revolving in an orbit about the atom center as a planet revolves about the sun. Surely, then, one of the differences between the atoms of the different kinds of matter is a difference of control over a revolving system of electrons. It had long been known that hints about the internal fabric of the atom would be most effectively sought with the spectroscope, but we have here gained at a single bound the most amazing insight into a most com-

plex structure. Here, also, we meet another of those astonishing previsions of Faraday. He tried Zeeman's experiment over fifty years ago, but was balked in his quest by the inadequacy of the instrumental equipment of his day.

The quite recent discovery of the wholly new and unsuspected property of radio-activity in a group of heavy elements has done much to confirm the views already expressed of the connection between electricity and matter, and much more. Radio-active phenomena suggest for the first time that some kinds of matter are not only unstable but mutable.

Taking radium as the most highly developed example of its class, we find it, with the help of its numerous progeny, sending out three distinct types of rays which for convenience of classification have been called alpha-, beta- and gamma- rays. The alpha-rays closely resemble canal rays. They carry positive charges and possess a mass or inertia comparable with that of the helium or hydrogen atom. The beta- rays appear identical with the cathode rays; they consist of negative electrons hurled out at speeds as great as nine-tenths the velocity of light. A speed of nine-tenths the velocity of light is hard for the mind to grasp, yet we must remember that an ounce of matter moving with this speed would carry enough energy to lift our whole navy over 100 miles in the air. Gamma-rays are of the nature of X-rays—a purely ethereal phenomenon. All these rays penetrate matter to varying depths, and absorption varies with the density as in cathode rays.

Alpha-, beta-, and gamma- rays all have the power of ionizing—that is, wrenching electrons free from the substances which absorb them. By their power to ionize gases a wholly new method of chemical analysis has sprung up—the method of analyzing by the electroscope. So marvelously delicate is this new radio-analysis that one part of radium in one one-hundred-million-million parts of uranium cannot escape detection. The electrometer test for differentiating the various radio-active substances is the time required for the fresh product gained by chemical manipulation to lose half its ionizing power. This important characteristic of each substance is disparagingly called its *rate of decay*.

By the aid of the new analysis Rutherford and others have found that radium is slowly disintegrating into radium emanation, which in turn changes into a distinct substance called radium A, and so on by successive steps down the alphabet to radium F, which is possibly a parent of lead. Helium gas appears also as a by-product of radium disintegration. From radium downward each of

the seven substances has a characteristic rate of decay ranging from 1300 years for radium to three minutes for radium A. Radium emanation is a gas which liquifies at  $-150^{\circ}\text{C}$ . Some of the later products seem to be solids. Is it not amazing that any of the properties of these six derivative products should be known at all, when never yet has one of them been seen, nor weighed, nor caught for direct examination?

Not only has radium offspring down to the sixth and seventh generation, but it apparently has ancestors as well. It is only a link in a genealogical chain. The probable discovery of radium's immediate parent was published recently by Boltwood. Uranium is thought a remoter ancestor, possibly a great grandparent. Accompanying the atomic disintegration of radio-active substances, large quantities of heat are evolved showing vast stores of energy hitherto unknown.

The most reasonable explanation yet offered of the observed radio-active phenomena indicates that the complex system of electrons revolving at enormous speeds within the atom gradually loses energy until this configuration becomes unstable. A sudden readjustment takes place, a kind of internal explosion by which electrons or alpha-particles or both are hurled out. The atomic structure thus relieved starts life as a new substance with a lower atomic weight. Later the new substance for a like reason again becomes unstable, another explosion occurs, and an atom of yet another substance is born.

If this interpretation of the evidence be accepted, a conclusion of vast importance may be drawn. We have, we cannot say going on before our eyes, but we may say in a sense going on under our hands, a slow evolution or transmutation of matter. This conclusion is not accepted as yet without reserve, for it strikes too deep at one of the assumptions of our older knowledge. Material atoms have long been thought of as immutably fixed for all time. But so were animal and plant species before Darwin. The growing evidence for this larger view of matter, though recent, is already too strong to be longer ignored. The burden of proof is gradually shifting, and to Alice's question "Why" comes back the equally pertinent "Why not" of the March Hare.

To gather a little together: The electron has but a thousandth part of the inertia of the lightest known material atom, and this inertia it doubtless borrows from the kindly ether and does not hold in its own right. Its behavior is that of an atom of negative electricity pure and simple. Its form is spherical and not spheroidal. Its size is probably less than one ten-millionth-millionth of

an inch. When revolving briskly enough in an orbit within the atom it gives us colored light of highest purity. When violently jostling irregularly about it gives us white light. Without it all light would be impossible.

We believe we have found electricity free from matter, but never yet matter free from electricity. Finally comes the suggestion that matter no less than life may be undergoing a slow but endless evolution.

Some of these things and many others have led physicists to suspect that if all electricity were removed from matter nothing would be left; that the material atom is an electric structure and nothing more. There are, however, many stubborn questions to which answers must somehow be found before the so-called electron theory of matter can be accepted unreservedly. As it stands it is at once a most brilliant and promising hypothesis, but has not yet reached the full stature of a theory. Should it hold good, the atom with its revolving electrons becomes the epitome of the universe. The architecture of the solar system and of the atom, the very great and the very small, reveals the same marvelous plan, the same exquisite workmanship. The conservation of energy becomes an ethereal law and the ether the abiding place of the universal store of energy.

To end as we began, we have matter and electricity, which some day may be one, and ether and energy. Of these we hope some time to build in theory a reasonable world to match the one we now so little understand. When all the interrelations among matter, ether, electricity, are separated out and quantitatively expressed, we believe our work will be complete. Such, then, is the confession of faith, the very far distant hope of the modern physicist.

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The cadet band is doing well under their new leader. It has 37 marching members this fall term. Following is its present roster and instrumentation: Piccolo—C. V. Ayers. Clarinets—E. J. Walters, A. Adams, H. A. Rankin, E. Reaume, C. M. McIntosh, C. M. Gibson, B. O. Warren. Saxophone—F. Kreamer. Oboe—F. Eldridge. Cornets—R. Boiselle, B. Haigler, N. B. Needham, T. A. Case, K. W. Phillipps, I. Ingraham, F. G. Pollom, G. H. Ross, R. Whitney, E. M. McDonald. Horn—E. Barnard, I. Howenstine, L. C. Shanton. Trombone—M. Collins, V. E. Dyatt, V. Florell, A. Hall, Chas. Myszka. Barytone—C. H. Tucker, P. Stuewe, L. B. Wolcott. Tuba—C. A. Sterling, N. Melbert. Drums—L. R. Hain, E. F. Kittell, D. G. Roth.

**Local Notes.**

The semi-weekly *Students' Herald* has a circulation of nearly 1200.

The Manhattan *Republic* has bought a new Babcock press and a folding machine.

President Nichols has commenced work on the time schedule for the winter term.

Dr. J. T. Willard has recently published a very valuable press bulletin discussing "Pure Bran."

State Dairy Commissioner Wilson went to Ellis, Friday of last week, to address a farmers' institute.

The next number of the lecture course will be furnished by the Whitney Bros., on Wednesday, November 11.

Prof. G. A. Dean was in Wyandotte county for several days this week investigating the orchards for the San Jose scale.

The new monthly journal, *The American Farm Review*, announces Prof. J. C. Kendall as its department editor for western crops.

Our football team will play the Creighton, at Omaha, Saturday, November 7, and the Oklahoma Farmers at Manhattan, Saturday, November 14.

The Manhattan street-car track is going in rapidly. About four blocks have been graded and "tied" and the work of laying the rails has been commenced.

There is some talk among the students of going to the football game between this College and Washburn, at Topeka, Saturday, November 21, in a special train.

The campus is still green and its trees and bushes are still clad in rich orange and purple dresses. It is a beautiful landscape, even at this late time of the year.

About fifty students went home to vote on Tuesday. Some who have no other home cast their vote in Manhattan or on College Hill, and still others found that they could not spare the time and the means to go home. Election day was very quiet at College.

The Eurodelphian Literary Society gave a Hallowe'en party to their friends, the Websters, Monday evening in the Women's Gymnasium. There were probably seventy couples present, all of them dressed in "spooky" attire and masked. Later in the evening all unmasked and were treated to pumpkin-pie, pop-corn, and sweet cider.

The Bankers' Association of the fourth group will meet in Manhattan, Friday, November 20, for an all-day session. The meetings will probably be held at the Commercial Club Hall. The membership includes twenty-five counties of the north-central part of the State. The officers of the association for this year are Geo. S. Murphey, president, and J. B. Floersch, secretary.

Assistant Schafer, of the Agronomy Department, has charge of husking the "ear-row" corn plots. An ear is planted to a row. About 400 rows were planted, including nine varieties.

Last Monday morning when the laborers went to work on the large heating tunnel that is being constructed between the new Veterinary Science Hall and the boiler house, the west bank of the ditch caved in, buried and killed a laborer and a team. The tunnel is being constructed of cement concrete in a ditch about twenty feet deep. The earth is of a tough clay at the top, but below this hard stratum it is glacial sand—almost like quicksand. It has given lots of trouble to the contractors—in fact two of them gave up the job before Bash & Gray, of Carterville, Mo., took hold of it. The name of the young man who was killed is Smith. He came here with the contractors from Missouri and has worked in Manhattan with his mule team all summer. The bank that fell upon him covered him and his team with over four feet of earth and he must have lost his life almost instantly. For twenty minutes over fifty men were digging to get him out, but life was extinct when they extricated him. The foreman of the job was also buried up to his waist, but escaped with a few minor injuries.

One campaign has just ended and another is beginning. In the one just ending there were opposing parties. In this one all are agreed in purpose, both the teachers and the taught, a farmers' institute campaign. The Kansas State Agricultural College is sending out this week eight of its trained people to hold farmers' institutes throughout the eastern half of Kansas. Beginning January 11 the work will be in western Kansas. Professors Dickens and Kinzer begin their meetings at Oskaloosa November 9, and then go to Effingham, Axtell, Marysville, Washington, Belleville, and Blue Rapids, talking fruit, roads, and better live stock. Professors Headlee and Wheeler and Miss Dow begin at Cottonwood Falls November 6 and 7, and then are to be at Emporia, Newton, Wichita, Kingman, Anthony, Wellington, South Haven, and Arkansas City, talking about injurious insects, better live stock, and better cooking. Asst. Supt. P. E. Crabtree and Professor Kendall begin their work November 6 and 7 at Lawrence, and then include Olathe, Paola, Mound City, Moran, Fort Scott, and Columbus. Professor Ten Eyck starts his "movable" school on November 6 at Minneapolis, and then to visit Beloit, Stockton, Hill City, Lincoln, Salina, and Abilene, talking for more corn and more wheat per acre. Then on November 6 and 7 meetings were also held at Alma with Professor Willard, Mr. Elling, and Miss Willis, and at Westmoreland with Superintendent of Institutes J. H. Miller and Prof. L. E. Call. All these meetings continue for two days, and at all places there is a permanent organization. At most places, too, there is a boys' corn contest, with prizes to be awarded, usually trips to the State institute. Another campaign will start out on November 27 and 28 with three circuits—southeast, southwest, and northwest.

The Thursday afternoon review of the College battalion attracts large numbers of visitors these fine fall days. We counted three autos, a dozen phaetons and at least fifty strangers on the campus at 3 o'clock Thursday afternoon.

A boys' corn contest at Rossville last Saturday brought together a fine lot of corn, a fine lot of boys, and a good attendance of farmers and others. The corn was judged by Prof. A. M. Ten-Eyck, who also delivered three lectures in which he presented points that is well for every corn farmer, whether young or old, to know. After the prizes had been awarded, a good pocket-knife was presented to each boy who had competed but had fallen short of a money prize. Hon. Bradford Miller, Maj. T. J. Anderson and representatives of *The Kansas Farmer* were Topeka's self-appointed delegates to the meeting.—*Kansas Farmer*.

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### ***Alumni and Former Students.***

Marian (Jones) Pincomb, '96, with her little son Morris are visiting friends in town and about College.

Catherine Ward, '07, and Jesse George, junior in 1907, were married July 30 at Minneapolis, Kan., and are now living on a farm near Capron, Okla.

Mrs. Minis and Mrs. Snodgrass are greatly enjoying a visit with Margaret (Minis) Snodgrass, '01, and M. D. Snodgrass, '06, at Kodiak, Alaska. They will remain for the winter in the far north.

C. A. Pyle, '04, who has been practicing as a veterinarian at Salina, Kan., has been elected to a position as assistant veterinarian in the University of Minnesota, St. Anthony Park, St. Paul, Minn., and left this week to enter upon his duties there.

Barton Thompson, '00, with his wife and baby, drove over from Waterville to Garrison for a visit with Carl Thompson, '04, and other friends and relatives, and came on to Manhattan for a short visit. They returned the first of the week to Waterville, where Mr. Thompson is in charge of a dairy.

Marie Bardshar, '08, is in New Orleans working among the Italian children. Her work seems to be somewhat varied, but consists in the main of teaching in night school and organizing and maintaining sewing classes at present. Later she hopes to introduce some work in domestic science. Her address is 1931 Melpomene street, corner Rampart, New Orleans, La.

Changes of address: Clara F. Barnhisel, '04, Indian School, Truxton, Ariz.; Gertrude (Hole) Campbell, '06, 1300 Lincoln street, Topeka, Kan.; J. G. Savage, '04, and W. Turnbull, '04, 529 E. street, San Bernardino, Cal., Colonel Albert Todd, '72, Fort Totten, N. Y.; Maude Hart, '01, Menaul School, Albuquerque, N. M.; Ruth Cooley, '06, Cananea, Sonora, Mexico; L. B. Pickett and Nell (Paulsen) Pickett, both of '05, Whiting, Kan.; A. D. Stoddard, '06, Box 529, Kansas City, Mo.

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| JULIUS E. KAMMEYER, A. M. (Central Wesleyan College) .....                                    | Professor of Economics                             |
| JOHN V. CORTELYOU, A. M. (Uni. of Neb.), Ph. D. (Heidelberg) .....                            | Professor of German                                |
| OLOF VALLEY, B. M. (Chicago Conservatory) .....                                               | Professor of Music                                 |
| F. S. SCHOENLEBER, D. V. S. (Chicago Vet. College) .....                                      | Professor of Veterinary Science                    |
| ROLAND J. KINZER, B. S. A. (Iowa State College) .....                                         | Professor of Animal Husbandry                      |
| WALTER E. KING, M. S. (Cornell) .....                                                         | Professor of Bacteriology                          |
| THOMAS J. HEADLEE, Ph. D. (Cornell) .....                                                     | Professor of Entomology                            |
| CHAS. H. BOICE, First Lieutenant Seventh Cavalry, U. S. A. ....                               | Professor of Military Science                      |
| JOHN C. KENDALL, B. S. (N. H. A. & M.) .....                                                  | Professor of Dairy Husbandry                       |
| JOHN O. HAMILTON, B. S. (Chicago) .....                                                       | Professor of Physics                               |
| MRS. MARY P. VANZILE .....                                                                    | Professor of Domestic Science                      |
| JOSHUA D. RICKMAN .....                                                                       | Superintendent of Printing                         |
| MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training ..... | Principal Preparatory Department                   |
| MISS ANTONETTA BECKER (Drexel) .....                                                          | Superintendent of Domestic Art                     |
| ROBERT J. BARNETT, B. S. (K. S. A. C.) .....                                                  | Librarian                                          |
| JOHN H. MILLER, A. M. .....                                                                   | Superintendent Farmers' Institutes                 |
| MISS LORENA E. CLEMONS, B. S. (K. S. A. C.) .....                                             | Secretary                                          |
| WILLIAM R. LEWIS .....                                                                        | Custodian                                          |

### ASSISTANTS.

|                                                                        |                                           |
|------------------------------------------------------------------------|-------------------------------------------|
| JACOB LUND, M. S. (K. S. A. C.) .....                                  | Superintendent Heat and Power Department  |
| ANDREY A. POTTER, S. B. (Mass. Inst. Tech.) .....                      | Asst. Professor of Mechanical Engineering |
| ROBERT H. BROWN, B. M. (Kan. Con. of Music), B. S. (K. S. A. C.) ..... | Asst. Professor of Music                  |
| BENJ. R. WARD, A. M. (Harvard) .....                                   | Assistant Professor of English            |
| GEO. A. DEAN, M. S. (K. S. A. C.) .....                                | Assistant Professor of Entomology         |
| GEORGE F. FREEMAN, B. S. (Ala. Polytech. Inst.) .....                  | Assistant Professor of Botany             |
| GEO. C. WHEELER, B. S. (K. S. A. C.) .....                             | Assistant Professor of Animal Husbandry   |
| WILLIAM H. ANDREWS, A. B. (Univ. of Chicago) .....                     | Assistant Professor of Mathematics        |
| ROBERT E. EASTMAN, M. S. (Cornell University) .....                    | Assistant Professor of Forestry           |
| LELAND E. CALL, B. S. (Ohio State University) .....                    | Assistant Professor of Soils              |
| L. E. CONRAD, M. S. (Lehigh) .....                                     | Assistant Professor of Civil Engineering  |

(Board of Instruction concluded on last page.)

# THE INDUSTRIALIST

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No. 6

## *Dry-Land Farming.*

(Extracts from address by Prof. A. M. Ten Eyck, president Coöperative Experiment Association of the Great Plains Area, delivered at Fargo, N. D., August 25, 1908.)

Members of the Coöperative Experiment Association of the Great Plains Area—I always forget the name of this association until I look it up. If we could just say Dry-land Farming Association, I think I would remember it, and I think others might remember it better, and such a name might attract more attention to our work. I find that very few really understand what the work of this association is, or its purpose. Possibly there might be something more in a name.

I lived in North Dakota six years ago and for five years I was connected with this Agricultural College, working under Professor Shepperd and President Worst. I did not know until President Worst spoke this morning just why I was not retained at this institution, but I see now and am pleased that he has made such a plain statement of facts. President Worst said in his address of welcome: "North Dakota is a good state for good people to come to and for bad people to leave." Nevertheless, you know it is an old saying, and seems to be true in this case, that "a bad penny always returns," and I am back for a time at least. I want to say, however, in regard to my work at the North Dakota Agricultural College and Experiment Station that the training under Professor Shepperd, and the inspiration from such talks as President Worst has given us this morning, has helped me in the work that I have done. If I have done any work of benefit to the farmers and the agriculture of the West, I feel that I owe it in part to these men and to the right kind of training. There is no better place to work in the whole United States than at the North Dakota Experiment Station. It is a splendid place to do something. There is not only the "lay of the land" and the environment of this institution, but the whole people are with you.

President Worst has cast a reflection upon me for leaving this state, but just to give you an idea of what I think of North Dakota: There is a young lady, one of the clerks in our office at the College,

who heard that I was coming up here, and she asked me to look around the country and tell her what I thought of it. She said she had a brother who was coming to this state to settle and she hated to have him go so far away: "it is such a cold country and so far away from everywhere." I told her that I was a citizen of North Dakota for five years, and that I knew the state well, and that next to Kansas "North Dakota is one of the best countries in the world." Now, you can see what I think of North Dakota when I could say a thing like that after being a citizen of Kansas for nearly six years. The people of North Dakota and the people of Kansas are something alike. They are hustling, hard-working people, very earnest and greatly interested in the work of the experiment stations.

It seems that all of our speakers this morning have let their minds run about in the same course, perhaps because we all agree on certain factors as being the most important with which we have to deal in this work. I have not prepared any special address for this occasion, but had determined to make some remarks on four problems of lines of work which we are undertaking, or should undertake in this Coöperative Experiment Station work: First, the improvement of crops for dry-land farming; second, soil moisture conservation by soil culture and other means; third, preventing the wasting of the soil by blowing and washing; and fourth, maintaining of soil fertility in this semi-arid belt. Now, I had planned to make a few remarks, not in detail at all, but just in a general way, along these four lines of work which we are interested in carrying on.

With regard to the improvement of crops through the coöperation of the experiment stations with the United States Department of Agriculture, a large amount of work has been done in testing varieties of grains and other crops from all parts of the world for growing in our dry-land areas. This work has been pretty thoroughly done, though there may be something to do yet along that line. It has resulted in introducing new varieties of crops from foreign countries for growing in our Great Plains region. Take the crops of Kansas for example: The Turkey or Russian wheat has largely replaced all other varieties. We have the Russian wheat and Russian oats, barley, and emmer. We have the Kafirs and sorghums introduced from Africa and cow-peas and soy-beans from Japan and China. In fact, there is scarcely a crop which we grow in the West to-day which has not come, quite recently, from another country. Formerly a great many of the crops grown throughout the Great Plains Area were

introduced from eastern United States, being replaced later by those which have proved to be better adapted to our soil and climate. Some further experiments may profitably be made along this line, but the main line of new work should be the improvement of these varieties which have been proven adapted to dry-land conditions by breeding and selection. There is no question with those who have had much to do with the breeding of wheat or other crops but that there is a great difference in the individual plants of a crop, and it is hoped that by breeding we may discover the great individuals and make them the basis for better strains or varieties.

I do not care to go into detail on this subject of breeding and selecting crops for our dry-land areas, but in my judgment it is one of the great and important lines of work, and will be of great value to our western country in improving the crops. I wish to call attention to one point or fact, however: The improvement of crops by breeding and selection must be done where the crops are intended to be grown. We have attempted to breed crops where they were not intended to grow with the result that we have not gotten the results which we should. Our experiment stations, in other words, have been located in the more favored locations and the breeding has been done here at Fargo, at Manhattan, at Lincoln, etc., instead of being done out there in the West where the crops must grow. That is where we must breed and select, and I am glad to learn that the North Dakota Experiment Station is taking the lead along this line in the matter of demonstration farms and substations.

Up to this time our experimental work has been largely with the matter of moisture conservation. As President Worst says, it is not so much the amount of precipitation, but whether that precipitation comes at the right time, and the conservation of the moisture in the soil which determines the crop. Farmers may still need teaching and instruction along this line, but the principles of soil moisture conservation are well known to-day. There are really only three important phases or problems in soil moisture conservation so far as tillage is concerned. First, to get the water into the ground; second, to have it come back to the crop again; and third, to keep it from evaporating into the air. These are the three principles of soil moisture conservation; and now, as Professor Burnett says, we must find a method for applying these principles. How are we to apply these principles to different conditions of soil in the growing of different crops, etc.? That is the work we will have to perform and carry out in our

demonstration farms, to show the farmer—give him an example. I find that examples are great teachers. If you can put a good example into a neighborhood it soon helps the whole community. The right example is a good thing. When we get a good farmer to take a limited quantity of our well-bred seed wheat, soon all the farmers in that community want that wheat, and in the course of two or three years they are bound to get it. And when a farmer sets an example that is better than his fellow farmers are practicing in the way of soil culture for the conservation of moisture, which results in better yields and larger crops, the others are going to practice it. What the farmers want is to have results shown them.

To work out these principles, to get the water into the ground, then back to the surface and keep it there without its going into the air, seems a simple proposition, but when you come to work it out under all of the different conditions which confront the farmer it is another proposition, and one which the farmer often thinks is too difficult to put into operation, and one which I think is not settled; that is, what is the method, or methods, which may apply under different conditions for carrying out these principles. I believe we are making, or have made, some mistakes in our teachings and practice of soil culture and soil moisture conservation. I find some people "out there in Kansas" who are practicing the "Campbell System" of culture. They have the idea that the soil should be kept stirred all the time on the surface. So in "summer culture" they plow and then they harrow and harrow and harrow, and the winds come and the soil blows away; and they harrow more and the soil blows more; and these farmers are beginning to believe that soil culture is wrong for the West. They tell me that when they practice thorough culture the soil blows worse than when the land is left uncultivated. We must discover a different method of soil moisture conservation for these people.

I have some ideas and some suggestions to make along that line, but will not state them at this time. I try to help the people of my own state when they have such a proposition, but I have no definite plan to offer as a solution of the problem of keeping the land from blowing in our western country. Thus you see one of the phases of our work is this problem of keeping the soil from wasting by wind and water.

I visited the Pomeroy farm in Graham county (Kansas) about two years ago. They were practicing the "Campbell System" of culture on a piece of fallow land that had been plowed rather early and which was being cultivated with the harrow every week or

ten days. This field lies on a slope above the orchard and yards. I arrived the next day after a four-inch rain and found the larger part of the soil mulch from that cultivated field spread over the orchard and yards a foot deep. The rain had simply swept away the loose part of that field.

This is a set-back to the "Campbell System." Continuous cultivation had simply wasted that land. If the soil must be kept loose at the surface, I can offer no solution of the problem to keep the surface from washing away. "Out there in Kansas," every once in a while, in spite of the fact that it is known as a drought-stricken country, we are apt to have too much water, sometimes five or six inches of rain in a few hours, and the farmers who cultivate and keep the surface mulch complain that the land will either be full of gullies and washes or the whole surface will be packed as hard as a floor after such a heavy downpour. The problem which we must solve in applying these principles is to find some method of farming that will save the land as well as save the moisture. Then again, I was in Western Kansas a year ago last spring at a time when the wind was blowing and the soil was drifting badly and I was told by a number of farmers around Hays that the men who had been doing the most cultivating were the ones who were hit hardest.

We may not have the proper conception of this matter of soil culture and keeping a soil mulch, especially for these western areas that are apt to blow. Keeping the surface loose all the time under certain conditions of soil and climate is wrong. I do not care to go further into detail just now; these are problems to be worked out. We can give no general rule for applying these principles. In fact, there are no general rules in agriculture that will apply everywhere—we must work out certain systems of farming for certain conditions.

The West as a whole has not as yet felt the need of soil fertility conservation to any great extent. The soils are usually rich in the mineral elements of plant-food. However, from my observation and experience I believe that the lands of the West are being more rapidly exhausted in fertility than the more humid soils of the Middle West and the Central States. In the first place, although the soil seems to be generally fertile and produces magnificent crops with a sufficient supply of water and with cultivation, yet the soil is not so rich in organic matter as the Mississippi Valley lands, or the lands which are not in the dry belt. Moreover, the very methods which we use to conserve soil moisture and to produce large crops may exhaust the organic matter of our western soils more

rapidly than less intensive culture. The cultivation of the land to conserve moisture liberates the plant-food that is in it with the result that the soluble plant-food may be lost by blowing and by washing. Perhaps the organic matter of these dry lands, especially in the dry seasons, may actually be completely oxidized and the gases, including nitrogen, escape into the air. In any case the humus and organic matter in these dry lands may be rapidly exhausted, so that these soils may soon become more exhausted in that particular element, nitrogen, than the soil of the more humid states.

This is a great problem which must be worked out. Professor Chilcott is working on this problem in his coöperative work with the different rotations that will help to solve this question of maintaining the organic matter by crop rotation and green manuring with the different crops that farmers will grow for maintaining the fertility of the soil. At the present time there are very few soil-improving crops which can be recommended for growing in the West which the farmers will plant. Such crops must pay for the planting and harvesting as well as fertilize the land. You will not find one man in a thousand who will plant a crop simply to manure the soil. The farmers want to plant a crop that will pay its way. Thus we have a problem to work out in the West—to maintain soil fertility and to return again to the soil the nitrogen and organic matter or humus which are being rapidly used up by thorough tillage and continuous grain cropping. It was my observation on the Pomeroy farm in Graham county that the land which had been cultivated most intensively for five or six years was more exhausted in organic matter than the soils on neighboring fields. In my judgment the fertility of that soil had been exhausted more rapidly by intensive culture. I believe, therefore, that this matter of maintaining soil fertility in the great plains area is one to which we should pay great attention. In our coöperative work with the government this is one of the lines of work which we will investigate.

I have prepared a paper to read to this association, which I have written out, but this little talk I had not prepared especially, and I thank you for your kind attention.

Every man has a Klondike in his own  
mind. Keep digging. 

***What is Pure Bran?***

(Press Bulletin No. 168.)

Consumers of concentrated feeding-stuffs have for years at times found more or less occasion for complaint in reference to their quality. This finally resulted in the passage of a State law nearly two years ago which, as amended last winter, is still in force. In its present form it requires no registration or special guaranty or tagging for pure bran or pure shorts, while impure feeds of the general nature of these must be registered as mixtures and be labeled so as to show the net weight of the package, the name and address of the manufacturer, the name of the feed, and a guaranty as to the percentage of fat and of protein. Hence a definition or description of pure bran becomes of considerable importance to manufacturers and consumers alike.

The chemist of the Experiment Station, who is by the law charged with the duty of inspecting feeding-stuffs in person or by deputy, holds that bran to be pure must not include anything that is separated from the wheat in preparing it for the milling process. Some wheat as marketed contains bits of straw, broken weed stems, oats, cheat, and other foreign substances that must be removed before the wheat enters the rolls for grinding. All such screenings must be excluded if the bran is to be classed as pure.

The shrunken wheat unfit for flour-making and also removed in this preparatory process is doubtless of equal feeding value with the bran, and its presence in bran is not economically objectionable, though technically an impurity. This shrunken wheat is by some millers ground and separated into a coarse part and a fine part, the former being put into the bran and the latter into the shorts. Such action is held to be legitimate, but this should not be taken as an approval of the introduction in a ground state of the other light materials of little feeding value. If such materials, either ground or unground, are marketed with the bran the product must be sold as "bran and screenings," and under the general label and guaranty referred to, and must be registered with the Director of the Experiment Station.

Some millers who make corn-meal dispose of the corn bran, separated in that process, by mixing it with the wheat bran. This practice is not legitimate, and if followed the mixture must be designated as "wheat bran and corn bran" and be registered and labeled as described above.

Millers can adopt and maintain a high standard for their bran, and put out a product in which they can take pride, only by keep-

ing out all adulterations. These by-products of questionable character can be disposed of without loss by making a mixed feed with which they may be incorporated, which must of course be registered with the Director of the Experiment Station annually and carry the proper label and guaranty. Purchasers will then know what they are getting, and Kansas bran will be of a uniformly high grade.

Attention may also be drawn to the fact that the rulings above stated are in harmony with the policy of the federal authorities in respect to mill products entering interstate commerce.

Consumers of bran and other concentrated feeding-stuffs are invited to bring to the attention of the chemist of the Experiment Station any evident disregard for the provisions of the feeding-stuffs law, bearing in mind that accidents are liable to occur in any establishment, and that millers as a class are of a high order of honor and integrity.

J. T. WILLARD,

*Chemist Experiment Station.*

The Music Department is preparing to give a rehearsal concert in the Auditorium on the morning of November 25 in connection with the chapel exercises. Following is a preliminary program:

|                                                    |                  |
|----------------------------------------------------|------------------|
| Prelude, "Madame Butterfly," <i>Puccini</i> .....  | Orchestra        |
| Hymn No. 24, "Come Ye Thankful People, Come,"..... |                  |
| "The Lord is My Shepherd," <i>Liddle</i> .....     | Professor Valley |
| Scripture Reading.....                             |                  |
| Prayer.....                                        |                  |
| Anthem, "Sing Alleluia Forth," <i>Buck</i> .....   | Chapel Chorus    |

Professor TenEyck has recently received samples of grain in the head from the government experiment station at Rampart, Alaska, sent by G. W. Gasser, '07, who is in charge of that station. The samples consist of Kharkof wheat, Black Winter emmer, Velvet Chaff spring wheat, North Finnish black oats, and Hulless spring barley. The samples are very fine, being even better than we are able to grow in Kansas, the wheat having four or five grains to the mesh, and the barley is very plump and heavy. One of the peculiarities is the long season required to mature the winter grains, the Kharkof wheat, for instance, being planted August 6, 1907, and harvested September 9, 1908, requiring more than 13 months to mature. The same is true of Black Winter emmer. On the other hand, the spring grains matured in a very short season, the Black Finnish oats being seeded May 22 and harvested August 28, while the barley was seeded May 22 and harvested August 19. These samples are on exhibition in the Agronomy Department.

***Local Notes.***

Manhattan has a business college.

Miss Hazel Parke burned her right hand rather badly in the chemical laboratory last Friday.

To-day, Saturday, the College will meet the Oklahoma farmers in the Manhattan Athletic Park.

Professor McKeever will read a paper before the Northwest Teachers' Association, at Concordia, at their Thanksgiving session.

Saturday, November 21, is the date of the annual football game with Washburn College at Topeka. The Agricultural College will go down in a special train and root to the tune of ten hundred.

The regular edition of the last annual catalogue being nearly exhausted, President Nichols had a 34-page abridged edition printed. It appeared this week as *Industrialist No. 6*, and is being sent out to parties who ask for information about courses of study.

Misses Ella Weeks and Elizabeth Putnam, of the Department of Architecture and Drawing, have prepared a set of very handsome original designs for the 1909 Y. W. C. A. calendar. The calendar will be printed by the Printing Department and distributed before Christmas.

The annual meeting of the farmers' institute was held yesterday and to-day in Olathe. A splendid corn show was held in connection and ten boys were awarded a free trip to the winter meeting in Manhattan as premiums. Two of the Agricultural College professors were present.—*Olathe Herald*.

Dr. J. T. Willard left last Tuesday for Washington, D. C., where he will attend the annual meeting of the Association of American Agricultural Colleges and Experiment Stations. From there he will go to Chicago to visit the International Live Stock Show. President Nichols will also attend the annual meeting at Washington and the Stock Show at Chicago, going there from New Orleans.

Many women attended the two-days' session of the farmers' institute which closed at Emporia to-day. Miss Ula Dow, of the Domestic Science Department of the Kansas Agricultural College, gave demonstrations in bread and cake making and with the fireless cooker. Mr. Wheeler and Mr. Headlee, also of the Agricultural College, made addresses, as did several Emporia men.—*Topeka Journal*.

State Dairy Commissioner Wilson walked into a down-town restaurant early Friday morning and, among other things, called for some butter. When the butter was produced he found it to be oleomargarine, so he asked the obliging waiter for a sack. He placed the oleo. in a sack, and after administering a brief lecture, which was right to the point, he walked out of the restaurant, telling the proprietor that the deal meant a fine of \$50 for him.—*Republic*.

The annual meeting of the "Manhattan Agricultural Fair Association," for the election of officers and directors, will be held in the rooms of the Commercial Club, in Manhattan, Kan., Tuesday, November 17, 1908, at 2 o'clock P. M., sharp. Every stockholder should be present, as important business will come before the meeting, and by its action will be determined whether a fair will be held next year.

Last Saturday was a day of glory for the athletes of the College. The first team went to Omaha, Neb., and beat the Catholics of Creighton College, one of the best College teams of the country, by a score of 13 to 0. The second eleven played the team of Battery D of Fort Riley, in the Manhattan Athletic Park, and beat them by a score of 29 to 16. Three cheers for the Knights of the Purple Hose and their trainers, Coaches Ahearn and Beall.

President Nichols left last Sunday for a trip to New Orleans, La., to investigate a business proposition involving the purchasing, draining and parcelling of a tract of land of about 45,000 acres laying a short distance southwest of that city and on the other side of the Mississippi. We understand that the President has not yet become a stockholder in the company, but that he may do so if he finds the proposition a promising one. The company which is being formed for the purpose of purchasing and reclaiming the land will consist mainly of Manhattan capitalists. The President intends to go to Washington from New Orleans to attend the annual meeting of the Association of American Agricultural Colleges and Experiment Stations.

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#### *Alumni and Former Students.*

W. L. Hall, '98, who is giving addresses on forestry in different parts of the country, was visiting friends in town Sunday and made a flying visit to the College Monday.

R. G. Lawry, '03, and Miss Mabel Irene Gordon were married Wednesday, October 28, in Chicago. They will be at home after December 15 at 319 West Seventy-second street, Chicago, Ill.

Mr. and Mrs. E. L. Shattuck, of Rushton, La., are happy in the birth of a son, Warren Locke Shattuck, on November 6. Mr. Shattuck is a member of the '07 class and Cora (Martin) Shattuck finished the domestic science short course in 1907.

At the home of Mr. and Mrs. Samuel Harris, on College Hill, November 4, at 8 o'clock, occurred the marriage of their daughters, Miss Lola May, '05, to Mr. H. Alanson Burt, '05, and Miss Leola Maude, '08, to Mr. Leroy E. Gaston, junior in 1907. The ceremony was solemnized by Rev. John E. Thackrey, '93, of St. Louis, uncle of the brides, in the presence of relatives and a few personal friends. Mr. and Mrs. Burt left for Bronson to visit his parents, and will reside in Leadville, Colo. Mr. and Mrs. Gaston went to Brown county to visit his parents, and will leave for South Dakota soon.—*Nationalist.*

Frank Harris, '08, has been elected county surveyor of Riley county, and Miss Hannah Wetzig, junior in 1895, has been reelected for another term as county superintendent of public instruction.

Allen W. Staver, second-year student in '96, and Jessie (Bayless) Staver, '98, Lenexa, Kan., are happy in the birth of a son, October 15, who will be company for little three-year-old Thelma Maurine.

Martha (Nitcher) Sowers, '01, Ames, Ia., writes correcting her address that she may not miss the INDUSTRIALIST and adds this item of news: On October 6, Clare Russell Sowers came to make his home with us."

Jas. R. Coxen, '07, in addition to teaching five classes in mathematics in the Goshen, Ind., high school, has the oversight of the high-school paper. He considers that his experience on the *Herald* and in the Printing Department had much to do with his securing the position which he now holds.

Changes of address: C. G. Clarke, '88, 307 Fifth Avenue, S. E., Minneapolis, Minn.; Geo. W. Owens, '99, Petersburg, Va.; A. J. Cowles, '07, 468 Sixty-ninth Avenue, West Allis, Wis.; F. C. Sears, '92, Amherst, Mass.; E. C. Gardner, '04, 3020 Calumet Avenue, Chicago, Ill.; R. C. Bowman, '07, Cherokee, Kan.; Ralph T. Chalender, '08, Hutchinson, Kan.; Hattie M. Noyes, '91, Zeandale, Kan., R. F. D. No. 1; Ivy (Harner) Selvidge, '93, 503 Williams street, Columbia, Mo.; L. W. Hayes, '96, 300 Western Avenue, Topeka, Kan.; Belle (Selby) Curtice, '82, 207 West Armour Boulevard, Kansas City, Mo.; L. V. White, '03, Havana, Ill., in care of Sanitary District of Chicago; A. E. Oman, '00, Farlington, Kan.; L. E. Humphrey, '77, Towner, Colo.; L. A. Fitz, '02, Agricultural College, N. D.; Evan James, '04, Lawrence, Kan.

At the recent election there were doubtless many graduates and former students among the candidates for office. Among these we note that H. W. Avery, '91, was elected State senator from his district. His presence in the legislature will doubtless be to the advantage of his Alma Mater. The following was published in the *Kansas Farmer* as the platform upon which he made his campaign: (1) Amendment to tax law; particularly as to money and real estate mortgages. The Creech recording fee amendment suits me. (2) Amendment to primary election law; particularly the elimination of the nominating petition. (3) Legislation for better country schools; consolidation is necessary. (4) A permanent State fair for Kansas. Personally, I believe that a candidate can show more useful courage by standing for some certain legislation than trying to boost the interest of some senatorial candidate that he may later, on account of the primary instructions, have to help defeat. More than that, if I read the signs aright, the people want to know what a man stands for, and I feel that they have a right to such information before the primary and before they vote for his indorsement. The man who has not the courage to stand for something before his nomination can not be expected to make a very aggressive fight after his election. —





*Board of Instruction (concluded).*

|                                                                 |                                        |
|-----------------------------------------------------------------|----------------------------------------|
| Miss Ada Rice, B. S. (K. S. A. C.)                              | Instructor in English                  |
| Miss Ella Weeks, A. B. (U. of K.)                               | Instructor in Drawing                  |
| Miss Daisy Zeininger, B. A. (Fairmount)                         | Instructor in Mathematics              |
| Leonard W. Goss, D. V. M. (Ohio State University)               | Instructor in Veterinary Science       |
| Miss Ula M. Dow, B. S. (K. S. A. C.)                            | Instructor in Domestic Science         |
| Theo. H. Scheffer, A. M. (Cornell University)                   | Instructor in Zoölogy                  |
| Herbert H. King, M. A. (Ewing College)                          | Instructor in Chemistry                |
| John B. Whelan, M. A. (Nebraska)                                | Instructor in Chemistry                |
| Louis H. Beall, A. B. (Denison)                                 | Instructor in English                  |
| William L. House                                                | Foreman of Carpenter Shop              |
| Miss Gertrude Barnes                                            | Assistant Librarian                    |
| Louis Wabnitz                                                   | Foreman of Machine Shops               |
| Miss Ina E. Holroyd, B. S. (K. S. A. C.)                        | Assistant in Preparatory Department    |
| Ambrose E. Ridenour, B. S. (K. S. A. C.)                        | Foreman of Foundry                     |
| Miss Emma J. Short                                              | Assistant in Preparatory Department    |
| Miss Ina Cowles, B. S. (K. S. A. C.)                            | Assistant in Domestic Art              |
| Miss Kate Tinkey                                                | Assistant Librarian                    |
| Earl N. Rodell, B. S. (K. S. A. C.)                             | Assistant in Printing                  |
| Roy A. Seaton, B. S. (K. S. A. C.)                              | Assistant in Mechanical Engineering    |
| M. Francis Ahearn, B. S. (Mass. Ag. College)                    | Assistant in Horticulture              |
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THE  
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Historical Society

Vol. 35

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**Kansas State Agricultural College**  
*Manhattan, Kansas*



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# THE INDUSTRIALIST

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No. 7

## *Forest Fires.\**

Not within recent years, perhaps not in the history of our country, have forest fires been so numerous and so much loss been caused by them as within the summer and fall months of the year 1908. Beginning in July in our Pacific forests of California, Oregon, and Washington, and ending just recently in the timber regions of New York, Pennsylvania, Maine, and New Jersey, there has been a continuous series of devastating fires affecting the British Northwest, our Rocky Mountain forests, the valuable white pine belt of Minnesota, Wisconsin, and Michigan, and the coniferous and hardwood forests of the New England states. The unparalleled losses of the past four months cannot be given at this time, but the great number of fires, the large size of some of them, the number of burned and destroyed settlements and towns, and the vast quantity of timber burned to ashes or charcoal, can but impress one with the great magnitude of the damage sustained by our country, our people, and our valuable and increasingly valuable forests.

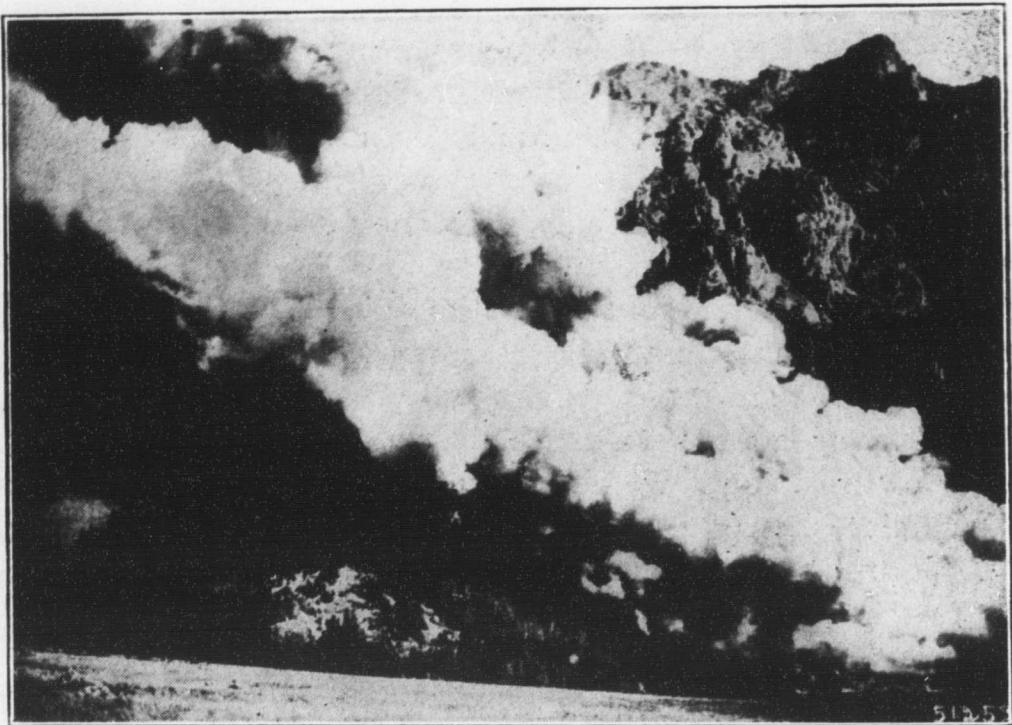
It is estimated that, on many days when the fires were burning most extensively and fiercely, a million dollars worth of forest and associated property went up in smoke each day. Such losses sustained in any other of our natural resources, but more especially of city wealth and property, would have been heralded by our public press as one of the greatest tragedies and misfortunes of modern times. Between two and three thousand lives have been lost in our country, due to forest fires. But such losses this year are small in comparison with the losses of other particular years. These fires have caused an enormous and incalculable, indirect loss, losses that only a well-versed student of soils, climatic conditions, and forest and agricultural crops, or an inhabitant of these stricken regions, can realize within an approximation of their extent.

For many years to come the path of the destroying element will be a landmark in our forest states, and for a longer period of time

\*The photos were kindly loaned us by the United States Forest Service.

memory will keep fresh the stories of experience and observation of the settlers and citizens of the surrounding country and towns of Fernie, Chisholm, Alpena, and many others, as they fled for safety or fought the approaching fire as they and others viewed the forest lands, the accumulated wealth of a century or more, made a desolate waste.

Yet history of previous years tells of forest fires of more particular and striking significance. In 1825, on the Miramichi river in New Brunswick, there occurred a forest fire of such magnitude



A fire scene in a Montana forest.

that in the space of nine hours it had burned a forest tract eighty miles long by twenty-five miles wide. Over two million acres were burned. A number of towns were destroyed, many hundred head of live stock perished, one hundred and sixty persons lost their lives, and the whole region suffered an incalculable impoverishment.

In the year of 1871, at and about Peshtigo, Wis., a more destructive fire destroyed over two thousand square miles of timber land. The timber and property valuation consumed amounted to many millions of dollars, and an estimated loss of human life of twelve to fifteen hundred. During the same year a strip of forest land forty miles wide by one hundred and eighty miles long was burned in the state of Michigan. Several hundred persons lost their lives, and the estimated timber loss is placed at four billion feet.

In 1881, Michigan again suffered a loss almost as great. Six years ago a forest fire in Washington and Oregon caused a loss of twelve million dollars. The greatest of modern or more recent forest fires, also an unnecessary one, was that at Hinkley, Minn., in 1894. The loss of human lives for this fire is put at nearly five hundred. The estimated property loss is twenty-five million dollars.

Each and every year there are forest fires. Last year, primarily because of climatic conditions, the fire loss was very small,



Cut over forest lands swept by fire—a desolate waste.

while during the year 1908, again because of climatic conditions, it being a very dry summer, the losses are thought to be the greatest in the history of our country. The census of 1880 gives the area burned over annually as 10,000,000 acres. In 1891, the Bureau of Forestry collected data and records of the burned area for one year, which in total equaled 12,000,000 acres, giving an estimated valuation of timber destroyed each year at \$25,000,000 to \$50,000,000. The loss due to lessened annual increment is placed at \$90,000,000. As pointed out before, we cannot know how great a loss is sustained as regards lessened soil fertility, losses due to washing of the rich surface soil, greater flood damages, the effects on river navigation, and the untold expenses in reclaiming deforested lands and making navigable the mud- and silt-ridden streams.

In spite of the known and recognized dangers of forest fires there still remains much to be learned, done and obeyed before

this greatest of all drains upon our forest wealth can be stopped. There exists a great deal of carelessness among persons and corporations in handling fire. Reading, observation in travel and experience in the Kainksu forest reserve has taught the writer that there is no real mystery as to how forest fires are started and how a little fire may and often does grow into an unconquerable agent of destruction. Yet the blue ascending wreath of smoke on the distant tree-covered mountain side, a place so wild and uninhabitable that man rarely if ever visits, suggests the question, "How did it start?" The answer may prove that the carelessness of man

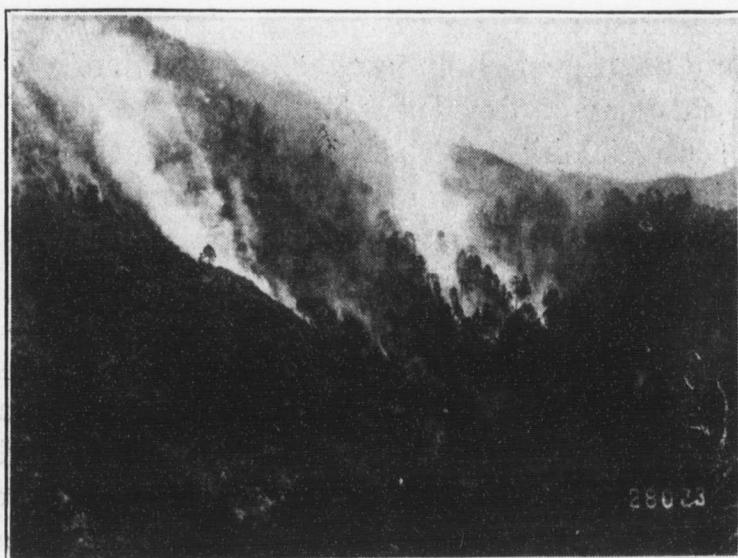


Making a fire trail through an opening in the forest.

is not the only cause of a forest fire. During the year of 1907 there occurred 1355 forest fires on the National forests. Reports by the forest officers furnish the following figures: Fires started by campers, 346; railroads, 273; lightning, 176; Donkey engines, 65; homestead settlers' carelessness in burning brush, 34; and by herders, hunters and incendiaries, 30. The beginning of four hundred of these fires is unaccounted for. Most of the fires during the past summer on the Kainksu National forest were supposed to have been started by lightning.

The government through the forest service is striving in every legitimate way to lessen the causes and frequency of fires. They offer every inducement of coöperation to the settlers, lumber companies, and railways. The writer is glad to know that there is a spirit of harmony, a feeling of common interest between these parties, as regards this most important problem of our American forests, fire. However, it is apparent that the railways are lax in exercising methods of precaution.

When a fire has once started, no matter what may be the cause, and little matter where it is, it is imperative that measures be taken against it at once. Fighting fire is the first and primary duty of a forest officer. All other work must be dropped. Neither holidays, night nor climatic factors are allowed to interfere with the fire fighting operations. They may modify the operations, but the great aim is to extinguish the fire or put it under control. One of the most important aids to lessen fire damages is an effective patrol system. This is amply proven by experience in our national forests, where, even though seriously handicapped by too



The fire burns most fiercely going up hill.

small a number of rangers and guards, in 1907 the forest officers had under control the 1355 fires before they had burned over fourteen one hundredths of one per cent of the National forest area. The present force of rangers and guards is 1351. Each one patrols and guards an average of 121,506 acres. The preponderating inadequacy of such a small force perhaps may be apparent to the general reader. It is stated that "upon the basis of the forest service, experience on the National forests on which the total administration per acre, including fire patrol, amounts to only one cent, the total forest area of the United States could be patrolled and protected from fire at a total cost of less than \$3,000,000."

Aside from the great need of effective forest officers in greater numbers, the greatest of aids, aside from the very important favorable climatic conditions, to facilitate forest fire fighting, are telephone lines, passable trails, roads, and effective fire lanes. The location of the fire, the rapid mobilization and the placing of

the fighting force at the fire are very important. Experience has told the writer that an hour may be of great value; that a man with a shovel, a mattock and an ax at the right place at the right time may accomplish more real good than a hundred men a week later. The utter impossibility of one to move rapidly through the almost impenetrable forests of the Rockies is known to many. A company of men, each loaded down with a fifty-pound pack of provisions, an ax, a shovel, and a canteen, may meet so many barriers that days may elapse before they reach the once small fire, now perhaps a widely-extended line of lurid flames. Trails and roads are not only of great usefulness in helping men to travel rapidly, but they are almost a necessity in passing provisions into the camp, and they may be of great help in checking the fire.

In the fiscal year ending June 30, 1908, there were built in the National forests 160 miles of road, 3300 miles of trail, 3500 miles of telephone lines, and a great deal of fire lane 16 to 100 feet wide. As forest fires are mostly put under control by making lanes through the forests, ahead of and around the fire, it is very important that the men are supplied with axes, shovels, mattocks, and other tools useful in felling and disposing trees and logs, leaves, brush, duff, and stone. A dry log lying across the proposed trail or an impenetrable heap of brush, timber, and logs, has caused many forest fire fighters to stop, take a fresh deep breath, and, looking at what he must get through before the flames reach him, he says, "Oh, \_\_\_\_\_," something, and begins again to chop or pull brush.

There is one thing that a person ignorant of fire fighting may first learn. He cannot extinguish a well-started forest fire by attacking the fire line, even though he struggle and work with his whole strength. Experience teaches fire fighters to work at it as a business occupation and not as a decisive body and nerve wrecking struggle. A common laborer will make common labor of it. If the fire cannot be put out to-day or this week, why it may be put out some other day or week. Quoting from the writer's "log book" some thoughts and feelings expressed on the scene of action: "During the afternoon the terrific fire awed and almost terrified me; the frightful intermittent thundering and suction-like noise, the smoke and flame, suggested an unconquerable and destroying power." No man or company of men can fight a forest fire "hand to hand," using the available equipment and working in such mountainous, brushy and loggy places. He or they must seek safety and fight the fire at a distance. In this connection the great value of forest roads, trails, creeks or riv-

ers, and fire lanes, becomes very apparent. Even though they are not wide enough to prevent a fire from jumping across, they do furnish a most desirable starting place either for back-firing or widening such barriers at strategic places. Seemingly there is no more important work in our National and private forests than the construction of abundant trails and adequate fire lanes and the clearing up of the millions of feet of menacing dead trees and logs, and the proper disposal of the dangerous abundance of brush. In some senses most of our forests are uncared-for, impenetrable wildernesses. Our government forest service and many other workers in forestry are anxious to improve conditions. They need a more liberal support by the legislative department of our government.

ROBT. E. EASTMAN.

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### *Distribution of Improved Seed-Grains.*

During the past four years the Agronomy Department of the Kansas Experiment Station has distributed over 4000 bushels of good seed of the best-producing varieties of winter wheat, 1500 bushels of well-bred seed corn, 800 bushels of seed oats, 850 bushels of seed barley, and smaller quantities of emmer, rye, flax, millet, cow-peas, soy-beans, Kafir-corn, and sorghum; a total of about 8000 bushels. This improved seed has been sold to some 2000 Kansas farmers, and a few others in neighboring states. The work is also receiving notice in foreign countries. Shipments of smaller quantities of improved seeds have been sent to South Africa, Italy, Australia, Russia, New Mexico, Alaska, Canada, Germany, China, Japan, Chile, and other South American countries.

Our improved seed-grain is sold upon order to anyone who pays the price (foreign shipments have usually been exchanges of seed with experiment stations) and is distributed in relatively small quantities, usually not more than twenty bushels of wheat or five bushels of corn to a single purchaser. This method allows for a wide (though perhaps not very uniform) distribution throughout the State. We keep a record of each purchaser and usually ask for a report every season, sending out a list of questions for each grower to answer. Some twenty questions are asked in the blank forms which are sent to the several growers. These questions are usually not very fully answered, yet on the whole some valuable data is being secured regarding the adaptation and productivity of the several different varieties in the different sections of the State. One of the main purposes of the report, however, is to learn the purity and quality of the crop, and what quantity of seed

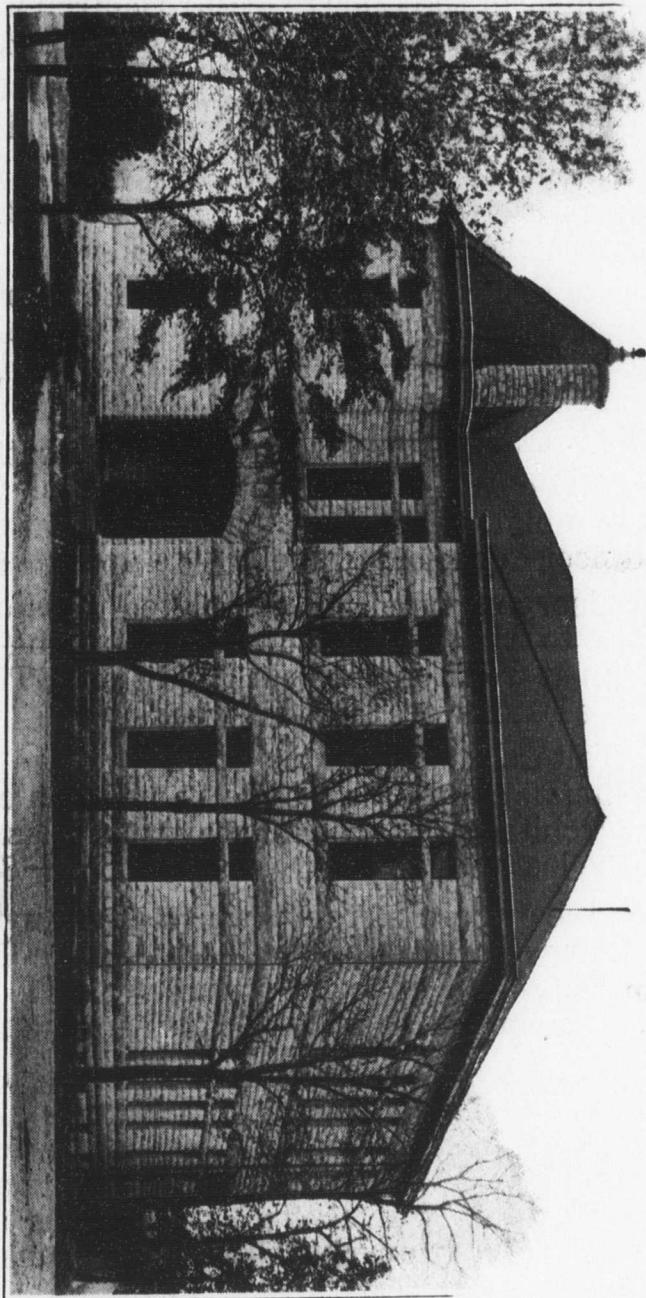
the party has for sale. Those having good pure seed for sale are listed, and when the supply at the College is exhausted this list is sent to farmers who inquire for improved seed grains. In this way perhaps 20,000 bushels of some of the best-producing varieties of wheat were distributed last fall.

Reports from the growers of College-bred seed have usually been very favorable, the College-bred seed producing larger yields of better quality of grain than the average. There is little question but that the varieties of wheat and other grain which have been carefully bred, selected and graded by this department have been improved in quality, productiveness, and hardiness. Where these crops are adapted for growing, the College-bred varieties will succeed better than those which have not been so carefully bred and selected. The difference is in the breeding and selection as well as in the variety.

A. M. TEN EYCK.

The stock-judging team of the College, consisting of students W. W. Hunt, R. E. Hunt, C. W. McCampbell, H. E. Kigen, and Ross Morman, will leave for Chicago on Monday to attend the International stock-judging contest. On their trip to Chicago they will stop at Lincoln, Neb., to visit the Nebraska Agricultural College and spend a day with Chandler Bros., at Chariton, Iowa, where they will judge sheep. They will also visit Singmaster's horse farm at Kiota, Iowa, to judge Percherons, Gilbreast's Clyderdale farm at DeKalb, Ill., and Stanley Pierce's Angus farm at Creston, Ill. At each of these places they will remain a day. They will arrive in Chicago on Friday night, November 27. The contest will be held on the following day. The team is the strongest that has represented the College at the International contest—the same team that won the trophy at the Kansas City Royal Stock Show this fall.

Do your best; and this old world, which is looking for more and better than it has, will see you, will push you just as high as you are qualified to go, and will pay you 100 cents on the dollar for all you are worth.



The New Home of the Printing Department.

***Local Notes.***

The Board of Regents will meet December 1.

Eight new residences are in process of erection within three blocks from the main entrance to the campus.

Professor Kinzer and his senior class in stock judging went to Wakefield, Monday, to study the herd of the Avery Bros.

The next number of the College lecture course will be a concert given by the Vassar Girls, on Wednesday evening, November 25.

The football game with Colorado Agricultural College will be played in the Manhattan Athletic Park on Thanksgiving afternoon.

The Department of Architecture is having a new blue-print room fitted up in the former office of Assistant Brandt, opposite Professor Walters' lecture room.

The heating tunnel running to the new Veterinary Science Hall, the construction of which has given so much trouble this summer and fall, is now completed. The ground is being leveled and the debris is being cleaned up.

The plumbing and heating of the new Domestic Science and Art Hall is about completed. This week the plumbers were at work on the plumbing heating system of the new drawing rooms on the second floor of the old chapel.

Contractor George Hopper has completed the stone work of the north addition to the old engineering building and has his force of masons at work on the south addition. The joists of the main floor of the latter were laid this week.

Professor Walters contemplates taking a trip to his home in Europe next summer and to incidentally make an extensive study of European architecture. His next year's classes will profit greatly from the lectures he will give on his trip.—*Students' Herald*.

West & Co., the owners of the new street-car system, have laid the ties for a large part of the line between the College and the Union Pacific depot and expect to start with the "railing" in a week or two. The main line will enter the campus at the east gate.

Manhattan is growing and pushing. The city council at their meeting this week made contract with a Kansas City engineering firm for plans and specifications for a new sewer system, covering the whole town site. It is estimated that the completion of the sanitary sewer system will cost about \$85,000, and the storm sewer system something over \$20,000. The plans and specifications will cost \$885.

The Sedgwick County Farmers' Institute opened a two-day meeting at Wichita, November 13. One hundred forty boys had corn entered for prizes and fifty girls entered canned fruit and jellies. Professor Headlee, Professor Wheeler and Professor Pratt of the State Agricultural College and Dr. W. N. Neil, a government inspector in the Department of Agriculture, were the speakers.—*Press item*.

The College team has again been victorious. Last Saturday afternoon they played the Farmers of the Oklahoma Agricultural and Mechanical College in the Manhattan Athletic Park. The score stood 40 to 10 in favor of our boys.

To-day, Saturday, the football team of the College, supported by nearly a thousand students, will go to Topeka to play Washburn College in their arena. The Washburn team is strong this fall and has won many victories and our boys will have a hard task before them, but we believe that the Farmers will come out victorious.

The show stock of the College for the International Exposition of live stock at Chicago will leave the College farm Tuesday evening. The herd will consist of four Shorthorn steers, five Angus steers, one Hereford steer, and one Galloway. They are in excellent condition and are fine enough to come home with laurel wreaths dangling over their brows.

If the beautiful fall weather will continue, the new cement walks between Horticultural Hall and the new green-house and between the Auditorium, the Library and the new Domestic Science and Art Hall will be finished in a few days. Contractor Geo. Hopper is pushing the work with characteristic energy and hopes to complete it inside of another week.

Henry Lawrence Call, the air navigator of Girard, whose flying machine ventures have filled the press of the State the past week, is a former student of this College. He was raised on a farm on Wild Cat creek about ten miles from Manhattan and attended College for several years back in the eighties. It is not known at this writing whether he was successful with his aeroplane at its first trip, but we know him to be a persistent student of physics and mathematics, as well as a good lawyer, and know that his efforts will be well directed whether successful or not.

#### *Alumni and Former Students.*

H. A. Burt, '05, is electrical engineer for the Leadville, Colo., Power and Lighting Company.

S. S. Young, '08, has been employed by the Chapman Electric Light and Power Company to remodel the old plant, and leaves this week to take up his work.

Changes of address: A. W. Barnard, '05, Weiser, Idaho; Edith Justin, '08, Beloit, Kan.; V. L. Cory, '04, Bureau of Plant Industry, Washington, D. C.; W. J. Yeoman, '93, Pretty Prairie, Kan.

Isabelle (Frisbie) Criswell, '94, with her two little daughters, has been visiting friends in town the past week. They will spend Thanksgiving in Topeka with relatives and return soon after to their home in Ames, Iowa.

George Doll, '97, Pierceville, Kan., writes that though farming in Finney county this year was almost a failure he still hopes for success. He and his family are getting along nicely and he hopes that he may be able to give his three children a college education at the K. S. A. C.

Kansas State Agricultural College  
Manhattan, Kansas

## State Farmers' Institute

December 28, '08, to January 2, '09

Stock and Stock Judging  
Corn and Corn Judging  
Poultry and Poultry Judging  
Dairy and Dairy Testing  
Cooking and Sewing

8 to 12 a. m. and 1 to 2:30 p. m., Judging, Demonstrations  
and Drill

2:30 to 5:00 and 7:30 to 10:00 p. m., Lectures

OPEN TO ALL!

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BOARD REASONABLE!

Fine Exhibit of Draft Horses, Beef Cattle,  
Hogs, and Poultry

Sessions begin at 8 a. m., 1 p. m., and 7:30 p. m.

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J. H. MILLER,

Superintendent Farmers' Institutes, Manhattan, Kansas

## Kansas State Agricultural College Manhattan, Kansas

# State Farmers' Institute and Allied Conventions

December 28, '08, to January 2, '09

Kansas Boys' Corn Contest Association  
Kansas Corn Breeders' Association  
Poland-China Breeders' Association  
Duroc-Jersey Breeders' Association  
Berkshire Breeders' Association  
Kansas Draft-Horse Breeders' Association  
Institute Officers' Conference  
Cattle Breeders' Conference  
Kansas Butter-Makers' Convention

A Strong Program Every Afternoon and Evening

Institute begins December 28 and ends January 2  
Come for the First Day and Stay for the Week

**Special Speakers.**— All of the speakers for the State Farmers' Institute have not yet been secured, but Supt. J. H. Miller announces now the following list: Ed. H. Webster, W. J. Spilman and A. D. Shamel from the Department at Washington; Prof. H. R. Smith, of the University of Nebraska, Prof. W. J. Fraser and Prof. Wm. Dietrich, of the University of Illinois, Prof. B. F. Mumford, of the University of Missouri. The institute will convene at 2:30 Monday afternoon, December 28, and adjourn at noon on Saturday, January 2.

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(Board of Instruction concluded on last page.)

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## *Domestic Science and Art.*

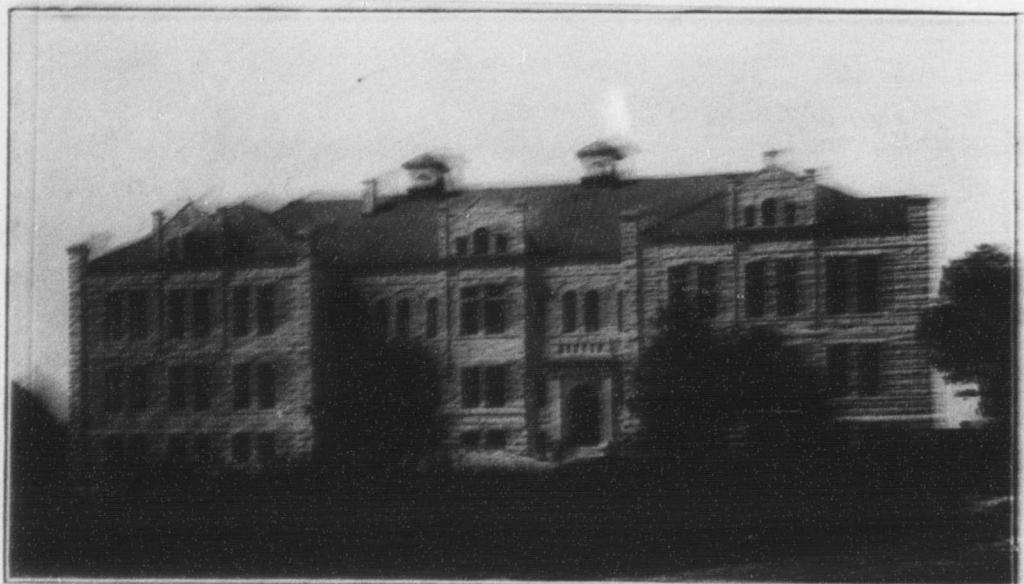
The opening of the present school year was attended by an event of special interest to the Domestic Science and Art Departments of the College. It was the time set for removing from their crowded quarters in Kedzie Hall into the large new Domestic Science and Art building. When Kedzie Hall was built it seemed that it would surely prove adequate for the needs of the departments for an indefinite period, but their phenomenal growth has made the new building a necessity. Its progress has been watched with a great deal of interest by the people of Kansas because it is perhaps the largest and finest building in the United States devoted exclusively to this line of work. The building is of limestone, as are the other buildings on the campus, and stands out prominently from any point of view. There are three floors to the building, including the basement, which is built largely above the ground.

The basement and first floors are devoted to the work in Domestic Science, while the second floor is occupied by the Domestic Art Department. There are two main entrances to the building, which faces the east. New cement walks lead from these entrances to the Auditorium on the east and to the other buildings of the campus on the north.

The kitchen laboratories of the building are large—26 feet x 36 feet—and are well lighted and ventilated. Connected with each laboratory is a locker room equipped with lavatories and locker cases. Each laboratory accommodates twenty students. Provision has been made for ten of these laboratories in the building. Six are in use at the present time. The desks are arranged in groups of two, with white porcelain sinks separating the groups. Each desk has two drawers for utensils, two smaller ones for supplies, and a large closed cupboard beneath. In the drawers are kept the forks, knives and spoons in definite order; in the cupboards are kept pans and larger utensils. Hot and cold water is piped to each sink; gas

will be piped to the desks, where each girl will have the use of a gas plate. Later individual ovens will be added.

One of the greatest improvements will be found in the practice dining-room and individual kitchens connected with it. There are four of these kitchens on either side of the dining-room. This forms one of the most ideal arrangements for the dinner work. A student may take this course in second-term junior or in second-term short course work. The divisions, consisting of four girls, are each assigned to one of these individual kitchens. In them are placed housekeeping equipment for a family of four—range,



New Domestic Science and Art Hall.

kitchen utensils, china, linen, etc. During the four weeks allotted to each division, each student has a week's experience in being cook, waitress, assistant cook and housekeeper for a family of four. Each cook is allowed a certain sum with which she must serve five meals for four persons. She thus meets the problems of economy, planning menus, marketing, and preparation and serving of meals. This is a very practical course, and with the new equipment should prove even more valuable than in previous years.

Two light, airy storerooms for food supplies are located on the basement floor. On the main floor are the offices and class rooms, besides several rooms which it is the plan to furnish as nearly as is possible as models. These consist of a bath-room, kitchen, dining-room, and reception-room. On this floor is a room occupied by the Young Women's Christian Association and is designed as a rest room for the girls in College. Connected with it is the office of the general secretary for the Y. W. C. A. Another room on

this floor is furnished and equipped similar to a room in a modern hospital. It serves to demonstrate the important points in home nursing, but will also be used in case of sudden illness of either students or teachers.

The girls taking the Domestic Science and Art course are taught the essentials in the construction of water, gas and sewerage systems of the home. The piping in the new building has been laid by the Mechanical Engineering Department of the College and is the best which can be put in. A conduit under cement floors carries most of the pipes. By an arrangement of movable cement slabs the pipes can be exposed, making demonstration class work possible. The electric wiring of the building has been done by the Electrical Engineering Department. Most of the wires have been carried through iron tubes in the tunnels to a switchboard on the lower floor. With these improvements the work of the departments can be carried on to a better advantage than ever before. With the building finished and furnished, Kansas may well be proud of what she has done for the girls of her State.

It has been the custom for several years for the College to offer to the young men from over the State the opportunity of coming to the College for a few days during the winter vacation for the purpose of class and lecture work in connection with the agricultural courses. Last winter a similar privilege was extended to the women of Kansas by the Domestic Science and Art Departments. Quite a number of girls and women came and found the week spent at the College one of profit and pleasure to them. An invitation is again extended to the women and girls of Kansas to spend the week beginning December 28, 1908, at the College. A course of lectures and class work has been arranged, which is sufficiently varied to meet the needs of the different individuals who may come. There is no fee. All the expenses connected with the work are those of railroad fare and living expenses while in Manhattan, and it is hoped that a goodly number of the girls and women of Kansas will avail themselves of this opportunity. Below is the program for the week:

MONDAY, DECEMBER 28.

AFTERNOON.

2:30 Visit to different Departments of the College.

TUESDAY, DECEMBER 29.

FORENOON.

9:00 Lesson in Cookery.—Subject, Vegetables: Character; composition; relative cost; value in diet; methods of preparation and serving.

10:00 Demonstration.—Cream of pea soup; buttered beets; lettuce salad.  
AFTERNOON.

1:00 Lecture, Miss Dow.—Subject, Water for the household and disposal of wastes.

2:00 Lesson in Sewing.—Mending and darning on gingham, cashmere, flannel, linen, and lace. Matching stripes and corners.

## WEDNESDAY, DECEMBER 30.

## FORENOON.

9:00 Lesson in Cookery.—Subject, Bread: Requisites for good bread; faults in bread; how to make it; description of ideal loaf. (Organization of class for laboratory work in bread making.)

10:00 Lecture, Miss Dow.—Subject, Emergencies: Conditions that affect health and comfort; what can be done without a doctor.

## AFTERNOON.

1:00 Lecture, Miss Becker.—Subject, The art of dressing well.

2:00 Lesson in Sewing.—Making plackets; drafting and making under-garments.

## THURSDAY, DECEMBER 31.

## FORENOON.

8:30 to 11:30 Laboratory work in bread making.

9:00 Lesson in Cookery.—Subject, Beverages: Tea; coffee; chocolate; their production and preparation; use in the diet; methods of preparation.

10:00 Demonstration.—Tea; coffee; cocoa.

## AFTERNOON.

1:00 Lecture, Mrs. VanZile.—Subject, Household hygiene: ventilation; heating; lighting.

2:00 Lesson in Sewing.—Drafting and making skirts.

## FRIDAY, JANUARY 1.

## FORENOON.

9:00 Lesson in Cookery.—Subject, Meats: Quality and use of different cuts; effect of various conditions on quality of meat; its place in the diet; methods of preparation.

10:00 Demonstration.—Use of fireless cooker; use of left-over meats in meat souffle; pan broiled steak.

## AFTERNOON.

1:00 Lecture, Miss Weeks.—Subject, Decoration and furnishing of the home.

2:00 Lesson in Sewing.—Drafting and making shirtwaists.

## SATURDAY, JANUARY 2.

## FORENOON.

9:00 Lesson in Cookery.—Subject, The Breakfast: Considerations necessary in planning; comparison of foods that usually comprise the breakfast; how to plan and carry out.

10:00 Demonstration.—Cream of wheat with figs; omelet; how to set the table.

CLARA WILLIS.

***Bacteria in Milk.***

The entire human family is, to a great degree, dependent upon milk as an article of food. Particularly is this true during the period of infancy, when milk is the chief if not the only food consumed. Individuals who are suffering and convalescent from various diseases in many cases require a milk diet. It is imperative, therefore, that we awaken to a realization of the fact that this article of food upon which we are so dependent should be free from any harmful or disease-producing attributes. Because of the fact that milk is so commonly used, it appears logical to conclude that if this food does contain harmful agents its ill effects will be wide-spread. Indeed, statistics bear out the latter statement.

Milk may contain various species of bacteria which are not specific disease-producing organisms, but which cause abnormal conditions in this article of food. Excessive acidity, the presence of various ferments and ptomains produced in milk by bacterial action probably cause more loss of life during the period of infancy than one can readily realize. From the fact that milk is an excellent food for these microscopic organisms, it is obvious that we must exert the greatest care in eliminating from it all harmful bacteria. Pure milk may contain bacteria; in fact, pure milk almost always contains bacteria, sometimes in countless numbers, but frequently these may be classed as normal milk organisms or harmless bacteria. Impure milk may contain, in addition to the normal milk organisms, those which are not essentially disease producing, but which cause abnormal changes in the milk. Impure milk may also contain specific disease-producing bacteria.

The bacterial content of milk depends upon various conditions. First, the number of these little organisms which fall into the milk while it is being drawn is an important factor. As each one of these bacteria may produce two organisms every thirty minutes, in milk which is being kept in a warm room, it may be clearly understood that age and temperature are also important factors. The glass of milk which we drink may contain 500 to 50,000,000 bacteria per cubic centimeter (about 15 drops), depending upon the foregoing conditions.

Bacteria are nearly always present in freshly drawn milk. It seldom happens that milk can be obtained under such conditions of care and cleanliness that the product is free from all bacteria. These small plants gain entrance from two sources of contamination—internal and external. Internal contamination is due to organisms which live upon the mucous membranes lining the teats

and udder of the cow. The bacteria may gain entrance to these membranes through the external orifice of the teat. These organisms, after gaining entrance, may find environmental conditions, such as temperature, food, etc., favorable to their growth, and begin to multiply on the mucosa of the teat and gradually creep up into the milk cistern and lactiferous glands. As rapidly as the milk is secreted in the udder it becomes contaminated with these bacteria which are living as parasites on the mucous membranes.

Bacteria which find their way into milk from external sources are, under ordinary conditions, much larger in number than may be supposed. External contamination of milk may be traced to the five following sources: The cow, the milker, utensils, air, and insects. Much evidence shows that from a few to many thousand bacteria fall into milk from each of the above sources. These minute organisms are swarming in the dirt and filth that may be found on a cow's flank, udder, and tail; they are floating on every dust particle in the air, and cling to the body of every insect; they exist in countless numbers on improperly cleansed milk-pails, strainers, and cans, and they abound on the dirty hands and clothing of the careless milker.

Extensive investigations have shown that most, if not all, of the changes occurring in milk, subsequent to its escape from the udder, are primarily caused by bacteria. For our purposes, in the present article, we may class all organisms which may be found in milk under three heads: (1) Normal or harmless. (2) Abnormal or harmful. (3) Disease producing.

1. *Normal Bacteria*.—Several species may generally be found in a given sample of milk, which are neutral in their action upon the product and which can cause no harm to the consumer. This class may be illustrated by several species of *micrococci*. The lactic fermentation or common "souring" of milk is brought about by a number of species of bacteria. Among the normal milk organisms may be placed the lactic acid-producing species, which bring about the splitting of the milk sugar molecule into lactic acid with a few other secondary products.

2. *Abnormal Bacteria*.—In the souring of milk by different species of bacteria, correspondingly different secondary or by-products are produced. In consequence of this, the souring is often accompanied with by-products which are undesirable, if not injurious to the consumer. In these cases the substances are often produced before the quantity of acid is sufficient to cause curdling. In fact, these by-products may become harmful while the milk is still considered sweet and wholesome. In addition to these pro-

cesses there are a number of other more troublesome changes, all of which are due to certain species of bacteria. Some of these conditions are blue milk, red milk, bitter milk, slimy milk, tainted milk, butyric acid fermentation, saponification, and still others which are less conspicuous and more rarely found.

3. *Disease Producing.*—These belong to two distinct classes: (1) The specific bacteria of certain diseases of cattle which may, if the animal is suffering from disease, gain entrance to the milk. In this class may be mentioned tuberculosis, the "foot and mouth" disease in Europe, and possibly anthrax. (2) The bacteria of certain human diseases, such as typhoid fever and diphtheria and the virus of scarlatina and measles. A very large number of epidemics of these diseases have been traced to the milk supply through which the infection occurred. The explanation of this is, that in cases where these diseases existed among the attendants or in their homes sufficient care was not taken in handling the milk to prevent the entrance of the virus of these diseases. In case of typhoid fever, the water used in rinsing the utensils may be contaminated. When diphtheria organisms contaminate the milk it often happens that those who have recently apparently recovered from the disease, but who still have the diphtheria bacteria in their throats, are engaged in milking or in otherwise handling the milk. By sneezing or coughing these organisms may be thrown from the throat into the milk.

From definite results which have been obtained we know that there is in the freshly drawn milk of the majority of cows some germicidal agent. In other words, there is in freshly drawn milk a substance or condition which has the power of destroying, or at least preventing the growth of, a certain percentage of the bacteria present.

The germicidal action of fresh milk is quite active in milk that is not kept in cold water or on ice, but after six hours this property disappears and the organisms multiply with great rapidity. On the other hand, milk which is kept at a lower temperature ( $40^{\circ}$  F. to  $55^{\circ}$  F.) retains its germicidal action for a much longer time. In milk which has been carefully handled and protected from external contamination, when cooled down promptly after milking to a temperature of  $40^{\circ}$  F., the number of bacteria will not subsequently exceed the number present at the close of the milking process.

While a numerical standard may not absolutely assure the purity of any given sample of milk, yet it is certainly of great value. If an individual were offered two glasses of milk, one of

which contained two million bacteria, the other ten thousand bacteria per cubic centimeter, he would not hesitate long before choosing the milk which gave the lower bacterial count. The number of bacteria in milk is certainly indicative of the care which has been exercised in handling the milk. Safety to the consumer depends upon the degree of care and cleanliness which the dairyman has practiced. The number of bacteria in milk is a gauge, indefinite though it may be at times, of the quantity of filth and dirt in the milk, the temperature at which it has been kept, and the age of the product.

The difficulty involved in producing milk which is reasonably free from bacteria rests with the methods employed by the producer, the manner in which the milk is transported, and the judgment used by the consumer in keeping the milk until utilized.

The dairyman should select for his herd animals which are absolutely healthy in every respect. These cows should be free from any inflammations of the udder, and should not react to the tuberculin test. All new cows that are secured should first be subjected to physical examination by a competent veterinarian before being placed with a regular herd. The cows should be kept in a well-lighted, well-ventilated, clean stable. The reason for this is that bacteria thrive best in a damp, dark, filthy stable. There should be no hay loft above the cows, because of the bacteria-laden dust particles which emanate from dry hay. The cows should be well groomed and the udder and flank should be wiped with a damp cloth before milking.

The attendants should be cleanly, intelligent, sensible individuals. No attendant should be employed who is affected with or convalescent from any infectious disease, or who comes in contact with any individuals suffering from an infectious disease. All milk utensils should be washed in boiling hot water or sterilized in steam, and after cleansing should be properly protected. The milk pails which are used should have relatively small openings, so that the chances of bacterial contamination from the air, dirt, etc., may be reduced. After milk has been produced under the best of conditions, it should be cooled at once to a temperature of from 40° F. to 55° F. It should be kept at this temperature during transportation. On account of the germicidal action of milk, which continues for a comparatively long time when the product is kept at a low temperature, there is no reason why milk cannot be shipped hundreds of miles and be delivered in a perfectly sweet and wholesome condition.

Finally, the consumer must do his part. It makes no differ-

ence how fine a quality of milk may be furnished, it will not remain in good condition unless properly treated. The milk should be kept in a cool place until it is used. It should be properly protected from dirt and bad odors. The application of common sense and good judgment in the combined efforts of the dairyman in the production and transportation of milk and the consumer in caring for the delivered product should eliminate all trouble from impure milk.

WALTER E. KING.

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### ***Adulterated Corn Chop.***

(Press Bulletin No. 169.)

Under the Kansas feeding-stuffs law pure corn chop is not subject to registration or tagging, but is subject to inspection in respect to purity and weight of packages. The law provides that all weights of feed stuffs shall be net; that is, a sack of corn chop purporting to be 100 pounds must weigh enough more to make up for the weight of the sack. Reasonable allowance should be made for atmospheric influences.

Pure corn chop is the product obtained by grinding well-cleaned shelled corn, removing nothing therefrom and adding nothing thereto. Anything resembling corn chop but not meeting the preceding definition must be treated either as a mixed feed or as one which has been subjected to a "process whereby the composition of the original material is altered." In either of these two cases the product must be registered annually with the Director of the Experiment Station and be labeled so as to show the name and address of the manufacturer, the true nature of the feed, the net weight, and the percentage of protein and of fat guaranteed.

In the manufacture of corn-meal the corn bran is removed by bolting, and the temptation is strong upon a miller to put this by-product in with his corn chop. This practice, as indicated above, is not legitimate, constituting in fact a serious adulteration. Corn bran, though possessing a good percentage of fat and of protein, is greatly inferior to whole corn in its content of starch and has a high per cent of fiber which is of little or no net feeding value. If a manufacturer wishes to work off his corn bran with corn chop he must plainly tag it as "Corn chop and corn bran" and sell it under all the conditions applying to mixed feeds.

So, too, if the miller after grinding corn removes some of the finest and best parts for corn-meal and sells the remainder as corn chop he is violating the law unless he sells it under a label

that shows its true nature, and has complied otherwise with all of the provisions of the feeding-stuffs law.

Again, corn chop is not to be made the medium through which screenings of various kinds are disposed of, neither is it to include rotten corn, corn-cobs, or dirt. There is no question that in the past much of such fraudulent feed has been foisted upon the public, and it is against such that the law operates.

The object of the law is to prevent unfair competition among manufacturers and fraudulent impositions upon consumers. The law will be enforced from this standpoint, and the hearty coöperation of the interested public is solicited. J. T. WILLARD.

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Several hundred students from the Kansas State Agricultural College came to Topeka from Manhattan on Saturday last to watch the football game between their own team and that of Washburn College. When this great crowd of Kansas' best arrived opposite *The Kansas Farmer* office, in their march up town, they stopped while the College band, which accompanied them, gave us a serenade. Following the music came a rousing cheer for *The Kansas Farmer*, and the parade marched on. This was a brief little incident, yet it was significant and most highly appreciated. It was significant as being a tribute to the great work that has been done by *The Kansas Farmer* in the past forty-five years in helping to bring about the wonderful prosperity of the Sunflower State. It was significant as a recognition of the help which *The Kansas Farmer* has given in the creation of the conditions which made the present State Agricultural College a fact. It was significant as showing an appreciation of the help this paper has given in instilling into the minds of these young men a love for and a desire to improve the life of the farmers of Kansas, whose champion this paper has always been. It was significant as showing their appreciation of the quality of the farmers' own paper which has furnished the mental pabulum for nearly half a century to their fathers and grandfathers, and which is now their own. Gentlemen, we thank you. The toast of the "Old Reliable" is, "May you always win!"—*The Kansas Farmer*.

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Regent Story, of this College, and Editor Kimball, of the *Manhattan Republic*, attended the conference, called by Governor-elect Stubbs at Lawrence last week, for the purpose of considering new measures to be laid before the next legislature. Mr. Story made a vigorous protest against the proposed plan of consolidating the boards of the three higher State educational institutions.

***Local Notes.***

The Board of Regents were in session at the College this week.

The work of laying the steel rails of the new street-car line from the Union Pacific depot to the College is progressing rapidly.

Professor Walters took his students in architecture to Topeka Saturday of last week to study the state-house and the Baptist church.

The members of the Faculty living in the upper part of the city have organized an athletic club. They meet for practice in the Y. M. C. A. Hall.

Miss Weeks and Miss Putnam, of the Department of Architecture and Drawing, spent their Thanksgiving vacation at the home of the former at Lincoln, Kan.

The second team, sixteen strong, under Coach Beall, left for Concordia the day before Thanksgiving and on Turkey day beat the Normalites in a spirited game.

Assistant Knight, of the Agronomy Department, took the grain-judging class to Topeka Saturday to judge corn at the Shawnee County Boys' Corn-Growing Contest.

The football game on Thanksgiving day in the Manhattan athletic park between the agricultural colleges of Colorado and Kansas resulted in a victory for our boys. The score stood 33 to 10.

The students to the number of over a thousand accompanied the football team to Topeka last Saturday a week ago to root for K. S. A. C. The battle with the sturdy Washburns was hot, but our boys came out victorious, the score being 23 to 4. The Congregationalists, though they had a good team, were outplayed all along the line. When the special trains bearing the happy team and the rooters returned to Manhattan there was a hot time in the old town. Two thousand people surrounded the depots to receive them and accompany them up town. A huge bonfire was started on main street, the band played patriotic airs and quicksteps, everybody shouted and howled, and it was nearly midnight before the celebration ended. "It was a famous victory."

Professor H. Brown reports the following membership of the College orchestra for this Fall term: *Violins*—Hand, R. R.; Shaw, L. L.; Seng, A. W.; Schlaefli, Jno.; Fowler, F. W.; Davis, Wm.; Deibler, Mable; Fate, Florine; Houska, H.; Miller, E. D. C.; Savage, G.; York, O.; Dyatt, V. E.; Krudop, D. *Oboe*—Eldridge, F. *Clarinets*—McKirahan, Chas.; Bates, H. P. *Cornets*—Sturgis, L. A.; Case, T. A. *Horns*—May, G.; Reynolds, R. *Trombones*—Collins, M.; King, W. W. *Cello*—Christy, Geo. *Bass*—Overholt, H. E.; Walthour, R. *Piano*—Davis, Leon. *Tuba*—Sterling, C. A. *Drums and Tympani*—Gray, D. D. The total number of members is twenty-nine. The orchestra is in excellent shape and is making rapid progress. A few of the pieces they are working on are the following: "Rosamunde," *Shubert*; "Madame Butterfly," *Puccini*; "Queen of Sheba," *Gounod*; "Boabdil," *Moszkowski*; "Red Feather," *DeKoven*; "Tancredi," *Rossini*, etc.

If a sufficient number are interested, a private class in Spanish will be organized next term.

The State legislature that convenes next January will be asked for \$807,000 for maintenance of the College for the biennial period of 1909-'11 and for new equipment and buildings to be built as soon as they can be constructed. This amount also includes the request of the Fort Hays Branch Experiment Station. It is the largest appropriation ever asked for the College, but there is a crying need for every dollar in the list of wants. As compared with the appropriations of two years ago, it is over a hundred thousand dollars greater. It is gratifying to note that a judging pavilion and an armory-gymnasium are among the items of the appropriation bill. After so long a wait it is a satisfaction to know that we will get something substantial and worth while. Following is a list of the various items of the appropriation bill:

*College.*—Current expenses, 1910, \$175,000; 1911, \$200,000; additional to mechanical arts building, \$60,000; armory and gymnasium, \$100,000; judging pavilion and barn, \$75,000; additional land, \$50,000; greenhouse, \$20,000; experiment station, \$50,000; farmers' institutes, \$32,000; engineering equipment, \$25,000; dairy herd and buildings, \$10,000; athletic field, \$5000; cement walks, \$10,000. *Fort Hays Branch Experiment Station.*—Current expenses, 1910, \$15,000; 1911, \$18,000; roads and fences, \$4000; office building, \$7,000; teams and equipment, \$7000; sheep and sheep barns, \$6000; horticulture and forestry, \$5000; colleges, \$3000.

The Manhattan Poultry Association will hold a poultry show in Manhattan December 17, 18, and 19, 1908. Manhattan is considered a good center for poultry fanciers, and in years past has held local and State shows successfully. A show held in an Agricultural College town, where agricultural students attend, ought to be a good advertisement for poultry breeders. There are many of the Agricultural College professors who have become interested in the poultry business and, since they are all fanciers, the number of poultrymen in the community is considerably increased. Judge W. A. Lamb, poultryman of the poultry department of the Agricultural College, will judge the birds. From the successes he has achieved at other shows, as an indication of his ability, every one has confidence in his judgment. The "singles" entry fee will be fifteen cents per bird, and the winners in singles will be given first, second and third ribbons, and two-thirds total entry fee on first, and one-third on second. No entry fee will be charged for pens, and single birds may enter as pens. The merchants of Manhattan have donated cash and merchandise for special premiums on pens and sweepstakes. All communications should be addressed to Harry Amos, secretary, Manhattan, Kan. The following is the list of officers and directors: President, Prof. G. C. Wheeler; vice-president, Wm. Dougherty; secretary, Harry Amos; treasurer, John Anderson; board of directors, J. R. Young, G. W. Shelley, Prof. A. M. TenEyck, Prof. J. O. Hamilton, L. E. Drown, and A. G. Philips.

The Horticulture Department has cleaned up and graded the grounds about the new Domestic Science and Art Hall and is now at work grading around the new Veterinary building.

The general passenger agent of the Rock Island Railroad Company wishes to run an excursion of students to the National Corn Exposition at Omaha on College Day, December 11. Fare for the round trip will be \$7.60, lodging 50 cents, and meals 25 cents. For 35 or more the company will provide a special chair car leaving Manhattan on the regular train at 4:14 A. M., reaching Omaha about noon. The train will return, leaving Omaha at 4:35 P. M., and will reach Manhattan about midnight, same day or next day. If 100 or more will go the company will provide a special train which will leave Manhattan about 11:00 P. M., and get to Omaha about 7:00 A. M., and leave Omaha at 4:30 P. M., or later if preferred, reaching Manhattan about midnight. In order to provide accommodations it will be necessary that the local agent get the information not later than December 8. All those who wish to attend the National Corn Show should register at the post-office not later than December 7.

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### *Alumni and Former Students.*

J. D. Trumbull, '96, made a flying visit to the College recently. He has returned from the Pacific coast, and after visiting friends in Kansas City and at Clinton he will take an extended trip south into the Lone Star state.

Changes of address: W. C. Howard, '77, Oakdale, Cal.; W. G. Shelley, '07, Office of Grain Investigations, Bureau of Plant Industry, Washington, D. C.; W. F. Lawry, '00, 6929 Yale Avenue, Chicago, Ill.; Chas. A. Pyle, '04, University of Minn., St. Anthony Park, St. Paul, Minn.; Emma E. Glossop, '83, general delivery, Omaha, Neb.

Nicholas Schmitz, '04, spent a day or two this week visiting the College and friends. He is still with the Department of Agriculture, his work being chiefly in connection with the introduction of alfalfa in the eastern part of the United States and experiments with it. Upon this trip he was relieving J. M. Westgate, '97, who is in charge of similar work west of the Mississippi. Mr. Schmitz has been elected agronomist of the Maryland Agricultural Experiment Station and will take up his new duties before spring.

It is with great regret that we announce that F. C. Burtis, '91, died November 23, at Rosedale, Kan., in the hospital of the University School of Medicine. Some time ago Mr. Burtis met with an accident which broke one of the thigh bones. This never united properly and an operation to relieve the difficulty was resorted to, but the shock was such that he never recovered. Mrs. Burtis (Louise Daly, '93) and the family of little children will have the sincere sympathy of many friends. Mr. Burtis was professor of agriculture in the Oklahoma Agricultural College for a number of years, but resigned two or three years ago to engage in business at Muskogee, Okla., where he has since resided.

*Board of Instruction (concluded).*

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(Board of Instruction concluded on last page.)

# THE INDUSTRIALIST

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MANHATTAN, KAN., DEC. 12, 1908.

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## *The Course in Printing.*

The new printing course is becoming quite popular, not only among the students but also with the newspaper fraternity. Here are some of the comments:

"The Kansas State Agricultural College has adopted a four-year course in printing. The office is equipped with an Optimus, two Chandler & Price Gordons, and other good machinery. In addition to the mechanical training, the course includes punctuation, reportorial work, correcting proof, editing copy, ad. writing, etc. Aside from printing, the course is a very practical one. The sciences, literature, history and mathematics receive attention; also such shop work as blacksmithing, machine-shop work, woodwork, one term of agriculture, two years drill, etc. The course leads to the degree of Bachelor of Science. The statement is made that 'It is not expected that at graduation a student will be an expert in any line, but he will have a broad foundation on which to build.' While a young man of energy could probably earn more after four years in a good printing-office than he could on graduation from this school, he would not have the general knowledge of the business in all its branches, would not have the college education, and five years later would probably be earning much less, and have poorer future prospects, than the college-trained man. Such an education costs something, but it is well worth the money, and this class of workmen is getting to be more and more in demand."

—*Pointers.*

"The Kansas State Agricultural College has attained a high standing among the colleges of the State. Kansas is not satisfied yet, however. This great agricultural State should have the greatest college of agriculture and mechanic arts in the world. The College is not stationary. New appropriations, new buildings and new courses are continually being added. A new course will be given next year in printing. There is great need for educated printers as there is need for educated men in all other pursuits. Mr. Rickman, superintendent of printing, with his limited re-

sources has turned out some of the best-trained men in the art of printing. Beginning with next year the Printing Department goes into a new building, and a complete four-year course in printing will be given."—*Kansas Farmer*.

*Progressive Printer*, a printers' magazine published in St. Louis, in a two-page write-up says:

"Kansas is commonly classified as an agricultural State, and if this were disputed within hearing range of a Kansan his ear-drum would beat the call to arms and there would be an engagement. But Kansas raises something that is above cereals in value, its yield to the acre of well-schooled men and women placing it at the top of the column of states in this crop, as well as in food products. From a catalogue issued by the Kansas State Agricultural College, at Manhattan, Kan., a grand institution by the way, the following evidence of advanced regard for the importance of printing as an art and an industry is taken. This matter pertaining to the work outlined for college instruction in fundamental-craft knowledge shows just how thoroughly Kansas does things, which gives realism to its motto. The preparatory courses in all other branches of education are just as complete as is printing."

Many others might be quoted, one from a London, England, paper.

The intent of the course is to fit the young man for the everyday work of the average printing-office. One enters the printing part of the course at the beginning of the sophomore year. He has by this time had his classics, advanced English composition, rhetoric, geometry, physics, elementary psychology, freehand, object and geometrical drawing, woodwork, and blacksmithing, all of which are needed in a printing-office. Nearly all the culture work taught in the College is included in the course—English, history, public speaking, rhetoric, civics, economics, psychology, etc.

Two terms' work in woodwork, one in blacksmithing, and one in motor power, both electric and gasoline, are given. The young man is taught not only to "run" his engines but to care for them. Few printing-offices are not equipped with either electric or gasoline motive power. The printer should be able to make his own slight repairs, and his instruction in the shops will help him along this line.

The newspaper man is expected to attend and take part in public meetings, as well as to write them up. Two terms in public speaking are given to assist him.

The mechanical part of the trade is made practical. The de-

partment is well equipped, and the range of work is greater than in the average office.

Editorial and reportorial work will be taught by competent men, and the culture, science and biological subjects will be handled by experts in each of the various lines. During the course the student will come in contact with and be under the influence of nearly every member of the Faculty.

The student will also receive instruction in methods and management, estimating jobs, buying and care of stock, care of rollers, etc.

The prospectus of the International Typographical Union "Course of Instruction in Printing" says:

"There is at present an almost universal recognition of the necessity for a broader education in the printing craft. The general public is awakening to an appreciation of what is truly artistic and beautiful, and in order to keep pace with this awakening the quality of printed products is daily becoming of a higher order. But with all this demand for better printing and better printers the opportunity for the apprentice to become a superior craftsman is even less to-day than formerly. Modern conditions do not favor the thorough education of the apprentice, and unless he is afforded the opportunity of supplementing his composing-room education with art instruction he will remain a mere mechanical tool in the hands of the better paid artist and designer. The day when the 'learning of the trade' was all that was necessary has passed. The coming printer must have knowledge that cannot be supplied through the routine of every-day work. The better grades of printing are to-day being produced under the direction and supervision of artists, men who, even though they know comparatively little of the mechanical details of the processes through which the catalogues and booklets pass, have an understanding of design and color harmony that enables them to lay out and follow to a successful completion work that is the wonder and despair of their less fortunate competitors. These artists—many of whom are printers who had the foresight to supplement their trade education with a study of the principles of art—are to be found directing the production of practically all of the printing houses which turn out a superior class of work. Numerous striking instances of this nature could be given, as could also many instances of printing houses equipped with the finest mechanical appliances and material, but whose products show the lack of this artistic supervision. These positions should be within the province of the printer, and will be within the province of the printer

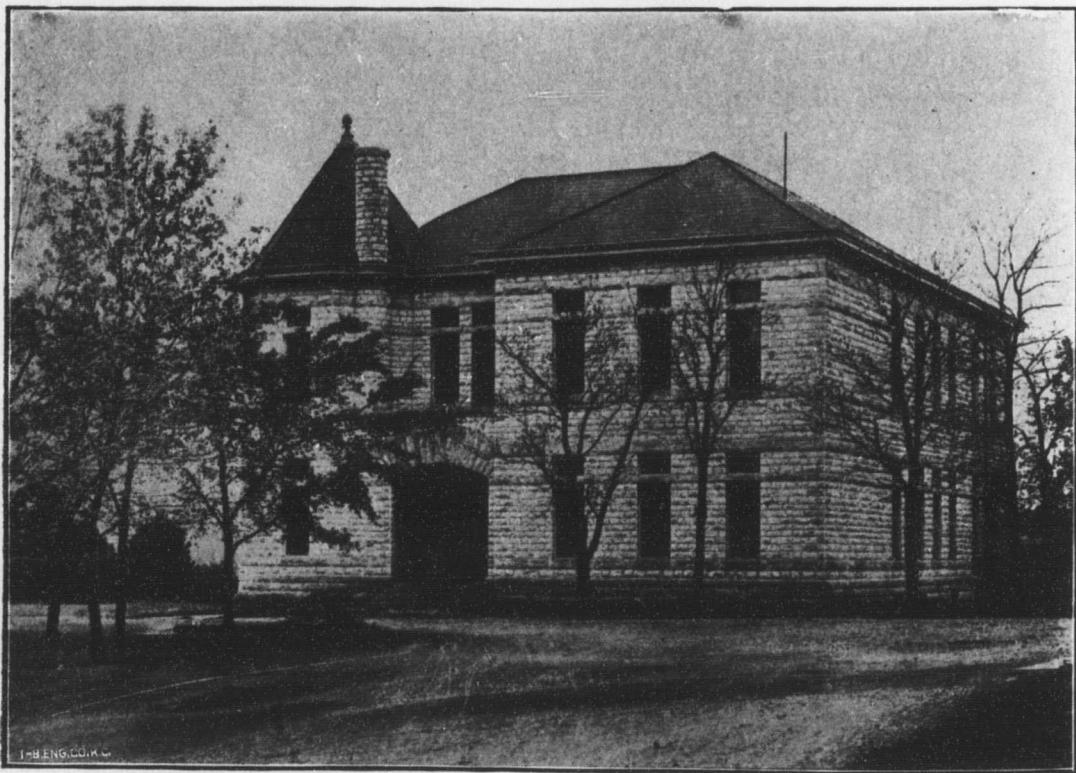
if he will do as these successful ones have done—grasp the opportunity to fit himself for them."

The course in printing is intended to meet this demand. The course is yet in its infancy, and in some parts may be weak or defective, but when it is considered that it is the first course of its kind ever offered, and that the framers had no guide or chart, it is not surprising that it may soon need altering or amending. And it will be altered when found needed.

The intent of the course is to fit the young man to successfully operate or manage a shop of his own from a to z. He will be fitted to supervise his employes. He will be capable of superintending the work of the larger establishments. There is a continual cry for more competent, practical and educated men in the printing trade.

It is not expected that at graduation a student will be an expert, but he will have a foundation and a beginning such as cannot be attained in any other way in so short a time.

J. D. RICKMAN.



The Home of the Printing Department.

## THE COURSE.

The number of hours per week required of "solid" studies appears in the first column. Subjects followed by figures in second column require no study outside of class periods.

## Freshman.

## FALL TERM:

Classics .....	5
Geometry I.....	5
Physics I.....	5
El. Psychology.....	1
Freehand Drawing.....	4
Woodwork I or Sewing I .....	4
Drill or Physical Training.....	4

## WINTER TERM:

Advanced Composition.....	5
Geometry II.....	5
Physics II.....	5
Object Drawing.....	4
Woodwork II or Sewing II.....	4
Drill or Physical Training .....	4

## SPRING TERM:

Rhetoric I.....	5
Trigonometry .....	5
Surveying or Color and Design I.....	4
Agriculture or Cooking .....	5
Geometrical Drawing.....	4
Blacksmithing I or Sewing III .....	4
Drill or Physical Training .....	4

## Sophomore.

## FALL TERM:

Chemistry I .....	5
Spelling.....	5
Composition I.....	10
Distribution.....	4
Machine-shop I.....	4
Drill .....	4

## WINTER TERM:

Chemistry II .....	5
Public Speaking I .....	5
Punctuation.....	5
Composition II.....	8
Drill .....	4

## SPRING TERM:

Chemistry III .....	5
Reportorial Work I.....	5
Public Speaking II.....	5
Composition III.....	6
Correcting Proofs.....	2
Drill .....	4

## Junior.

## FALL TERM:

Rhetoric II. ....	5
Proof-reading I.....	2½
Reportorial Work II.....	5
Zoölogy I .....	5
Ad. Composition and Distribution .....	4

## WINTER TERM:

English History .....	5
Editorial Writing.....	5
Proof-reading II.....	5
Editing Copy.....	4
Make-up and Imposition .....	4
Job Lock-up.....	2
Job Composition .....	4

## SPRING TERM:

Civics .....	5
Bacteriology I .....	2½
Motors .....	2½
Estimating Jobs.....	2
Job Presswork I.....	10
Cutting Stock .....	2

## Senior.

## FALL TERM:

English Literature I.....	5
American History .....	5
Job Presswork II.....	16
Trimming and Tabbing.....	2
Methods and Management..	4
Paper, Rollers and Inks....	2

## WINTER TERM:

Economics.....	5
English Literature II.....	5
Psychology.....	5
Cylinder Presswork I.....	16

## SPRING TERM:

Philosophy.....	5
American Literature.....	5
Cylinder Presswork II.....	16
Thesis.....	5

## Graduate.

## FALL TERM:

Elective .....	5
Modern Language I .....	5
Tabular Composition .....	4
Practice Work .....	10
Ad. Writing.....	8

## WINTER TERM:

Elective.....	5
Modern Language II .....	5
Color Composition.....	4
Practice Work .....	10
Adv. Editorial Work.....	8

## SPRING TERM:

Elective .....	5
Modern Language III .....	5
Color Presswork .....	8
Practice Work .....	10

***Local Notes.***

The *Nationalist* has installed a new book and job press.

Captain Boice and a couple of his Fort Riley friends went quail hunting last Thursday.

Sixteen new Manhattan residences were connected with the city water-works last month.

Kansas State University will be here on Monday to play a game of basket-ball with our invincibles.

The Mechanical Department is hard at work on the heating plant for the new Veterinary Science Hall.

The assignment committee of the Faculty are busy with assigning students for the winter term. It is expected that every student will get his schedule of work fully settled before he leaves for home.

Dr. K. W. Stouder, assistant in the Veterinary Department, has received a merited promotion by the Board of Regents at their meeting last week. They gave him the rank of assistant professor of veterinary science.

December 9 will always be a red-letter day in the calendar of Dr. and Mrs. T. J. Headlee since it marks the date of a notable addition to the happiness of their home in the birth of a daughter. May her future be filled with all good!

The boys of the football team have elected John Gingery captain for next year. Prof. J. V. Cortelyou was elected general manager; H. H. King, treasurer; Ostlund, football manager; Randels, track manager, and "Mike," coach.

The Board of Regents at their session last week elected Miss Gertrude Barnes librarian. Miss Barnes has been assistant librarian since 1900 and has earned her promotion by faithful work and close attention to the innumerable duties of the Library Department.

The annual Y. W. C. A. calendar for 1909 is now on sale—price 35 cents. It consists of an artistic cover and six very handsome plates decorated by new half-tones of campus pictures. The designing and hand decorating was done by Miss Weeks and Miss Putman, of the Department of Architecture and Drawing.

State Architect Stanton was at the College last Wednesday to make a final examination of the work of Contractor Henry Bennet on the new Veterinary Science Hall. He accepted the building and ordered the final settlement. Professor Schoenleber and his assistants and classes will move into the hall during the holidays.

The Manhattan *Republic* figures out that the increase of the value of the townsite, exclusive of the improvements, since last March amounts to \$600,000, or to \$100 for every man, woman and child living in the city. It counts up the many improvements now in sight and figures out that the increase for next year will be equally great.

Professor Walters will read a paper before the annual meeting of the Kansas Stock Breeders on "Cement Concrete in and Around the Barn."

The following teams will play this winter on our home schedule: Nebraska University, William Jewell, Lindsborg, Southwestern College of Winfield, Nebraska Wesleyan, Kansas Wesleyan, and Baker. None of the games have been positively dated as yet. In addition there will probably be a game with Missouri University about the first of February.

The Athletic Association has leased the Y. M. C. A. gym. for practice and for the regular conflicts on the basket-ball schedule. The seating capacity of the gym. will be made as large as possible, though it is hardly expected that it will accommodate the attendance. The schedule is incomplete, but K. U. will be the attraction here on December 14.—*Students' Herald*.

The Dairy Department will conduct a butter makers' scoring contest here the last of the month, during the State Farmers' Institute. Samples of milk, butter and cream from over the State and from creameries will be brought in to be tested. To the parties whose products score 90 or over, diplomas will be given, and to the winners, suitable text-books.

Fall term closes Friday noon, December 18. The final examinations will be held Thursday and Friday. The winter term will begin January 4, 1909. During the vacation the State Farmers' Institute and a number of conventions will be held at the College. The boys' corn-judging contest will also be held during the last week before the reopening of College. Superintendent Miller, of the College extension work, expects several hundred school boys here at the contest.

Prof. R. J. Kinzer and his stock-judging team returned last week from Chicago, where they took part in the annual International Live Stock show. The team won fifth place in the contest, the Iowa State College again winning first honors, as it has in the past eight years. Kansas State Agricultural College won fourth in judging horses, second in cattle, fourth in hogs, and seventh in sheep. Senior student C. W. McCampbell won second honors in the individual scoring.

Prof. J. C. Kendall and the dairy-judging team, composed of F. W. Hall, W. A. Ball, and E. E. Ferguson, returned Sunday night from a week in Chicago, where the team participated in the students' national dairy judging contest. There were nine college teams entered. The reports of the contest give the Jersey trophy to Nebraska, the Holstein trophy to New York, the Guernsey trophy to Iowa, the Dutch Belted trophy to Iowa, and the sweepstakes prize for individual judging to F. D. Hawk, of Iowa. Of our College team we can say that they came out second in the Holstein contest, making 495 points in a possible 600. E. E. Ferguson made the highest general scores of the College team. The milk and cream which the College sent also received honorable mention.

The first basket-ball game of the season was played Wednesday night at the Y. M. C. A. gymnasium between the College and Cotner University, of Nebraska. The score stood 59 to 25 in favor of our boys.

The new green-house is still "nearing its completion." The cement floors are now finished, the heating pipes are laid, the benches are in place, and as soon as a few finishing touches can be made the Horticultural Department will move its plants into the new quarters.

#### *Alumni and Former Students.*

W. B. Thurston, '06, and Stella (Campbell) Thurston, '06, are the parents of a son, born December 2, at Enid, Okla.

John Hoffman Johntz was born Sunday, December 6, to Daisy (Hoffman) Johntz, '00, and John E. Johntz, of Abilene, Kan.

We hear extra good reports of the work of May Umberger, '07, as teacher of domestic science in the Parsons, Kan., high school.

Jessie L. Marty, '08, is enjoying her work this year at Teachers' College, Columbia University. Her address is 1230 Amsterdam Avenue, New York City.

Allie (Peckham) Cordry, '82, keeps the routine of daily home work from dwarfing her development by sustained interest in women's clubs and writing society and club news for the Parsons *Sun*.

H. R. Heim, '06, is still in the employ of the Westinghouse Electric Manufacturing Company and is stationed at Minneapolis, Minn. He is connected with the industrial and power department, 936 Metropolitan Life Building.

The promotion of Albert Todd, '72, to be colonel in the artillery corps from October 10, 1908, resulted in his relief from duty with the general staff, and he is now in command of the artillery district of eastern New York, with headquarters at Fort Totten, N. Y.

Arthur Cranston, '90, Parsons, Kan., is to be one of the members of the next legislature. As such he expects to "be in a position to assist the good old K. S. A. C. in forwarding its excellent work in making farming in Kansas more desirable and in sustaining the school as the highest exponent of progressive agricultural education in the United States." Mr. Cranston is an able man and will leave an impress on legislation, no doubt.

Changes of address: L. W. Lawson, '07, 459 Sixty-fourth Avenue, West Allis, Wis.; R. N. Dorman, '04, 1328 North Jackson street, North Topeka, Kan.; Kate Alexander, '06, Kensington, Kan.; G. L. Melton, '93, 106 North Boneforte street, Santa Cruz, Cal.; E. O. Sisson, '83, University of Washington, Seattle, Wash.; A. E. Oman, '00, Forest Service, Washington, D. C.; C. E. Davis, '06, Woodlawn Inn, Pittsfield, Mass.; Cora E. Swingle, '00, 551 Church street, Ann Arbor, Mich.; Lillian (St. John) Williams, '91, 616 South Tenth street, Kansas City, Kan.

C. F. Stewart, '07, 207 Wood street, Chicago, Ill., is now employed by the Automatic Electric Company. He finds his work congenial and instructive.

Harriet (Nichols) Donohoo, '98, spent nearly two weeks here visiting her mother and sisters and will visit her brothers at Herington and Liberal on her return to her home at Tucumcari, N. M. She is the president, and it may well be believed one of the most effective members, of the Bay View Reading Club of that city, which meets weekly at the homes of its twenty-four members.

The editor is in receipt of a copy of the *Anaheim (Cal.) Gazette* which contains accounts of the experiences of about a dozen alumni in connection with making loans to Superintendent T. who severed his connection with this College in 1897. He had some difficulty in getting away on account of unpaid debts and owed several of the College people money which for the most part he has never paid. It seems that he has been working on the sympathies of College graduates from one end of the Pacific coast to the other, and this paragraph is inserted for the purpose of putting the alumni on guard. It is with great regret that his old friends find that he is working a confidence game of this kind, but that such is the case there is overwhelming evidence. The writer has seen a letter from A. A. Mills, '89, Anaheim, Cal., in which the experiences of himself and others are circumstantially stated.

Ed. H. Webster, '96, was elected director of the Agricultural Experiment Station of this institution at the recent meeting of the Board of Regents, and will enter upon his new office soon. Mr. Webster was one of the best students in his class, took graduate work in dairying at the Iowa State College, receiving the Master's degree, and was appointed assistant in dairying here in 1899 when dairy work at the College was in its infancy. Later he was with the Brady-Meriden Creamery Company, assistant in dairying in the Iowa State College, and assistant professor of dairying in this College, successively. In 1902 he was advanced to be professor of dairying here, but resigned in 1903 to become inspector and dairy expert for the United States Department of Agriculture, and the next year he was general superintendent of the Littleton Creamery Company, Denver, Colo. In 1905 we find him Chief of the Dairy Division of the Bureau of Animal Industry, United States Department of Agriculture, which position he has ably filled up to the present time. When the professorship of dairying here became vacant last year, Professor Webster was elected to fill it, but was persuaded to decline the position in order to continue in charge of important work in progress in the Division of Dairying. Professor Webster has won all of his positions and promotions by hard, careful, thoughtful work, and there is every reason to expect that he will succeed in the difficult task upon which he enters. His friends and those of Mrs. Webster (Nora Fryhofer, '95) will be glad to welcome them back. Their greatest regret is the necessity for leaving the beautiful Virginia home, which they have recently purchased, with its magnificent old trees.

***Program of State Farmers' Institute, Manhattan, Kan., December 28, 1908, to January 2, 1909.***

MONDAY AFTERNOON (Old Chapel).

2:30 Address of Welcome.....Pres. E. R. Nichols  
Kansas State Agricultural College.

2:45 The Corn Plant.....Mr. A. D. Shamel  
United States Department of Agriculture.

3:45 Entering Boys' Corn.

MONDAY EVENING (Old Chapel).

7:30 Music.

The Art of Seed Selection and Breeding.....Mr. A. D. Shamel  
Agricultural Education.....Mr. W. J. Spillman  
United States Department of Agriculture.

TUESDAY MORNING.

8:00 Corn Judging.....Agricultural Hall  
Stock Judging.....Barn  
Dairy Testing.....Creamery  
Poultry Class.....Creamery  
Cooking and Sewing.....Domestic Science and Art Hall  
10:00 Work continued. Stock- and Corn-Judging Classes Change.

TUESDAY AFTERNOON.

1:15 Sheep Judging .....Barn  
Corn Breeders' Section (Old Chapel).  
J. M. Gilman Presiding.

2:30 Lectures—Corn Breeding.....Mr. Shamel

3:15 Some Recent Breeding Experiments.....Prof. A. M. Ten Eyck  
Kansas State Agricultural College.

4:00 Some Fundamental Principles of Breeding.....Mr. W. J. Spillman

TUESDAY EVENING (Auditorium).

J. M. Gilman Presiding.

7:30 Some Corn and Forage Experiments at the Hays Branch Experiment Station.....Supt. C. K. McClelland

8:15 Shall Kansas Import or Breed its Wheat? Foreign Wheat as seen by American Eyes.....Prof. H. F. Roberts  
Kansas State Agricultural College.

9:15 Some Insect Problems for the Corn Grower.....Prof. T. J. Headlee  
Kansas State Agricultural College.

WEDNESDAY MORNING.

8:00 Judging and Demonstration Work as Outlined for Tuesday.

## WEDNESDAY AFTERNOON.

1:15 Horse Breeders' Business Meeting.....Agricultural Hall  
Dairy Section (Old Chapel).

2:30 Lectures—Building up a Dairy Herd in Kansas...Prof. J. C. Kendall  
Kansas State Agricultural College.

3:15 The Kansas Farmer as a Dairyman.....Director E. H. Webster  
Kansas State Agricultural College.

4:00 Better Things for the Dairymen.....Prof. W. J. Fraser  
University of Illinois.

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## WEDNESDAY AFTERNOON.

## Sheep Breeders' Section (Chemistry Building).

2:30 Lectures:

Sheep Raising in the Corn Belt.....Mr. E. E. Hazen  
Hiawatha.

Discussion.

Mistakes in Selecting Breeding Sheep.....Prof. R. J. Kinzer  
Kansas State Agricultural College.

Selecting a Type and a Market.....W. B. Baird  
La Cygne.

Organization of Sheep Breeders' Association.

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## WEDNESDAY EVENING (Auditorium).

7:30 Dairying in Kansas as Compared with other States.....  
.....Director E. H. Webster

8:15 Feeding for Milk or Beef.....Prof. D. H. Otis  
University of Wisconsin.

9:00 How to Increase the Profits in Milk Production, with suggestions  
from European Dairying.....Prof. W. J. Fraser

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## THURSDAY MORNING.

8:00 Judging, Demonstration, etc., as Outlined for Tuesday.

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## THURSDAY AFTERNOON (Old Chapel).

1:15 Cattle Judging.

2:30 Lectures:

Beef Production with High-Priced Corn.....Prof. H. R. Smith  
University of Nebraska.

The Tuberculous Cow.....Dr. F. S. Schoenleber  
Kansas State Agricultural College.

Some Factors in Profitable Beef Production.....Prof. F. B. Mumford  
University of Missouri.

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## THE INDUSTRIALIST.

## THURSDAY AFTERNOON.

Institute Officers' Conference (Chemistry Building).

2:30 Suggestions Looking to Improvement of our Institutes—C. F. Miller, Ft. Scott; P. E. Crabtree, Manhattan; J. H. Bratley, Wichita; Ira L. White, Mankato; G. A. Laude, Yates Center.

## General Discussion.

4:00 Some Suggestions as to Legislation.....Supt. J. H. Miller

## THURSDAY EVENING (Auditorium).

7:30 Some Needed Legislation for the Horse Industry in Kansas.....Professor Kinzer

8:15 Some Forestry Problems.....Mr. W. L. Hall  
United States Department of Agriculture.

9:15 Animal Husbandry and Farm Economics.....Professor Mumford

## FRIDAY MORNING.

8:00 Judging and Demonstration as Outlined for Tuesday.

## FRIDAY AFTERNOON.

1:05 Swine Breeders' Business Meetings.....Room — Anderson Hall

2:30 Some Recent Experiments with Hog Cholera.....Prof. W. E. King  
Kansas State Agricultural College.

3:15 Market Classes and Grades of Swine.....Prof. Wm. Dietrich  
University of Illinois.

4:15 Care of the Brood Sow.....Prof. G. C. Wheeler  
Kansas State Agricultural College.

5:00 Swine Breeders' Business Meetings.

## FRIDAY EVENING.

7:30 Fitting for Show and Sale.....Mr. Geo. M. Hammond  
Manhattan.

8:15 Breeding vs. Feeding.....Professor Dietrich

9:15 The Kansas State Agricultural College and its Needs—Professors TenEyck, Kendall, Kinzer, Dickens, Headlee, McCormick, and Doctor Schoenleber.

## SATURDAY MORNING.

8:00 Judging and Demonstration Work as Outlined for Tuesday.  
11:00 Adjournment.

Write for boarding accommodation to Mr. Wm. Davis, Y. M. C. A. secretary, or Miss Jessie R. Burton, Y. W. C. A. secretary. Address other correspondence to J. H. Miller, Superintendent Farmers' Institute, Manhattan, Kan.

**Kansas State Agricultural College**  
**Manhattan, Kansas**

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**State Farmers' Institute**  
and  
**Allied Conventions**

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**December 28, '08, to January 2, '09**

Kansas Boys' Corn Contest Association  
Kansas Corn Breeders' Association  
Poland-China Breeders' Association  
Duroc-Jersey Breeders' Association  
Berkshire Breeders' Association  
Kansas Draft-Horse Breeders' Association  
Institute Officers' Conference  
Cattle Breeders' Conference  
Kansas Butter-Makers' Convention

**A Strong Program Every Afternoon and Evening**

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**Institute begins December 28 and ends January 2**  
**Come for the First Day and Stay for the Week**

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**Special Speakers.**— All of the speakers for the State Farmers' Institute have not yet been secured, but Supt. J. H. Miller announces now the following list: Ed. H. Webster, W. J. Spilman and A. D. Shamel from the Department at Washington; Prof. H. R. Smith, of the University of Nebraska, Prof. W. J. Fraser and Prof. Wm. Dietrich, of the University of Illinois, Prof. B. F. Mumford, of the University of Missouri. The institute will convene at 2:30 Monday afternoon, December 28, and adjourn at noon on Saturday, January 2.

*Board of Instruction (concluded).*

Miss Ada Rice, B. S. (K. S. A. C.)	Instructor in English
Miss Ella Weeks, A. B. (U. of K.)	Instructor in Drawing
Miss Daisy Zeininger, B. A. (Fairmount)	Instructor in Mathematics
Leonard W. Goss, D. V. M. (Ohio State University)	Instructor in Veterinary Science
Miss Ula M. Dow, B. S. (K. S. A. C.)	Instructor in Domestic Science
Theo. H. Scheffer, A. M. (Cornell University)	Instructor in Zoölogy
Herbert H. King, M. A. (Ewing College)	Instructor in Chemistry
John B. Whelan, M. A. (Nebraska)	Instructor in Chemistry
Louis H. Beall, A. B. (Denison)	Instructor in English
Roy A. Seaton, B. S. (K. S. A. C.)	Instructor in Mechanical Engineering
William L. House	Foreman of Carpenter Shop
Louis Wabnitz	Foreman of Machine Shops
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Ambrose E. Ridenour, B. S. (K. S. A. C.)	Foreman of Foundry
Miss Emma J. Short	Assistant in Preparatory Department
Miss Ina Cowles, B. S. (K. S. A. C.)	Assistant in Domestic Art
Miss Kate Tinkey	Assistant Librarian
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M. Sheldon Brandt, Ph. B. (Yale)	Assistant in Architecture and Drawing
Chas. Yost	Assistant in Heat and Power Department
Earle B. Milliard	Foreman of Blacksmithing
J. T. Parker	Assistant in Woodwork
J. D. Magee, A. M. (Chicago)	Assistant in Mathematics
E. G. Meinzer, A. B. (Beloit)	Assistant in German
Miss Florence S. Latimer, B. M. (Ferry Hall Seminary)	Assistant in Music
Miss Marjorie Russell (Mechanics' Institute)	Assistant in Domestic Science
Burton Rogers, D. V. M. (Iowa State College)	Assistant in Veterinary Science
Miss Clara Willis (Framingham Normal)	Assistant in Domestic Science
C. O. Swanson, M. Agr. (Minn.)	Assistant Chemist, Experiment Station
Edw. C. Crowley, Ph. B. (Yale)	Assistant in Chemistry
Hugh Oliver	Assistant in Heat and Power Department
Miss Charlaine Furley, B. A. (Fairmount)	Assistant in English
Miss Jessie Reynolds, A. B. (U. of K.)	Assistant in Preparatory Department
Miss Mary F. Nesbit, A. B. (Illinois University)	Assistant in Mathematics
Miss Annette Leonard, A. B. (U. of K.)	Assistant in English
William C. Lane, B. S. (K. S. A. C.)	Assistant in Electrical Engineering
Miss Flora C. Knight, A. B. (Univ. of Wyoming)	Assistant in English
Miss Grace H. Woodward (Boston School of D. S.)	Assistant in Domestic Science
Miss Nellie Cave, B. M. (Univ. of Nebr.). (Chicago Music Coll.)	Assistant in Music
Miss Margaret Mack (K. S. N.)	Assistant in Preparatory Department
Edwin G. Schafer, B. S. (K. S. A. C.)	Assistant in Agronomy
Orin A. Stevens, B. S. (K. S. A. C.)	Assistant in Botany
Miss Mary W. Hancock (Mechanics' Inst.)	Assistant in Domestic Art
S. W. McGarrah, A. M. (Grove City College)	Assistant in Mathematics
Carl G. Elling, B. S. (K. S. A. C.)	Assistant in Animal Husbandry
Kirk H. Logan, B. S. (U. of K.)	Assistant in Physics
C. A. Arthur Utt, B. S. (Cornell College)	Assistant in Chemistry
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C. S. Knight, B. S. Agr. (U. of Wis.)	Assistant in Agronomy
Earle Brintnall, B. S. (Iowa State College)	Assistant in Dairy Husbandry
J. B. Parker, M. A. (Ohio State University)	Assistant in Entomology
Allen G. Philips, B. S. (K. S. A. C.)	Assistant in Poultry
Miss Gertrude Cannon, Bethany Col. and Oberlin Conservatory	Assistant in Music
Miss Bertha Bisby	Assistant in Preparatory Department
Fred M. Hayes, D. V. M. (K. S. A. C.)	Assistant in Veterinary Science
L. D. Bushnell, B. S. (Wisconsin)	Assistant in Bacteriology
Miss Bertha Donaldson (Chicago University)	Assistant in Domestic Art
Miss Elizabeth Putnam (Chicago Art Institute)	Assistant in Drawing
L. E. Petty, A. B. (Wabash College)	Assistant in Mathematics
Jules C. Cunningham, B. S. (K. S. A. C.)	Assistant in Horticulture
Miss Annie E. Lindsey (Simmons College)	Assistant in Domestic Science
H. E. Kirby	Assistant in Printing
John E. Smith, B. S. (Oregon Ag. Col.)	Assistant in Botany
R. C. Wiley, B. S. (Oklahoma A. & M. College)	Assistant in Chemistry
D. Edmond Rudolph	Band Leader
Wm. A. Lamb	Poultryman
Floyd Howard	Farm Foreman

Historical Society

# THE INDUSTRIALIST

Vol. 35

No. 10

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*Manhattan, Kansas*



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# The Industrialist.

|                          |                 |
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| PROF. J. D. WALTERS..... | Local Editor    |
| PROF. J. T. WILLARD..... | Alumni Editor   |

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(Board of Instruction concluded on last page.)

# THE INDUSTRIALIST

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MANHATTAN, KAN., DEC. 19, 1908.

No. 10

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## *State Dairy Contest.*

From December 28 to January 2, inclusive, there will be held a State Farmers' Institute at the Kansas State Agricultural College. At this time there will be meetings of interest to all dairy-men and creamery men of Kansas, and all who can are urged to be present. From December 29 to January 2 a poultry institute will be held, during which time all the important phases of practical poultry raising will be ably handled by competent speakers. Housing, feeding, management, sanitation, incubation and brooding will be discussed in the mornings and judging in the afternoons. All interested in improving the poultry conditions in Kansas are urged to be present.

During this institute the Dairy Department of the College will hold, in connection with the scoring contest for creamery butter makers, a contest for farm dairy butter makers, one for cream to be scored and graded from a creamery standpoint, and one each for market milk and market cream. In each of the last four classes there will be awarded a first and second prize to the two contestants sending the best and second best samples, respectively. These prizes will consist of books dealing with some phase of dairying that is applicable to the producer's position.

Also to each contestant whose butter, cream or milk scores 90 points out of a total of 100 or better will be given a diploma stating the score and signed by the judge and the head of the Dairy Department of the College.

Mr. J. G. Winkjer, who will score the creamery butter exhibited, will also score the dairy butter and grade the cream. Arrangements are being made to secure the services of an expert from the United States Department of Agriculture to score the market milk and cream.

*Farm Dairy Butter.*—Dairy butter is that butter made from the milk from one herd of cattle, and made at the place where the milk is produced. This butter can be exhibited in the form in which it is marketed, but it will be best to send it in prints or in 5-pound or

10-pound tubs. If prints are sent there should be at least two 1-pound prints. Pack these in such a manner that there will be no danger of injury while in transit, and send by prepaid express to the Dairy Department, Kansas State Agricultural College, to arrive not later than December 26, 1908. This butter shall become the property of the Dairy Department. The points taken into consideration in scoring butter are as follows:

|              |    |
|--------------|----|
| Flavor.....  | 45 |
| Body.....    | 25 |
| Color.....   | 15 |
| Salt.....    | 10 |
| Package..... | 5  |

The cream to be graded from a creamery standpoint shall be in from 2- to 10-gallon lots and shall be shipped by prepaid express to the Dairy Department of the Kansas State Agricultural College on December 24, 1908. The cream will be paid for at the prevailing market price per pound of butter fat. This class is open to all those delivering cream to creameries or cream-receiving stations, and to the cream-receiving stations themselves.

A full account as to how the cream is produced and handled until shipped shall accompany each lot.

The cream will be graded as follows:

**First Grade.**—Cream which, according to the Babcock test, contains 30 per cent fat or more and which contains .2 of 1 per cent of acid or less, as shown by the alkali test. The cream shall also be of a good flavor and clean, and contained in a clean container. The different lots of cream falling in this grade will be ranked as to the amount of acid each contains and as to its flavor and cleanliness and the condition of the container.

**Second grade.**—Cream testing between 25 per cent and 30 per cent of fat and containing between .2 and .3 of 1 per cent of acid, and that is reasonably clean and sweet. Cream falling within this grade shall be ranked according to both the fat content and the acidity as well as the flavor and cleanliness and condition of the container.

**Third Grade.**—Cream testing less than 25 per cent of fat or testing .3 of 1 per cent of acid or more, or falls below second grade in any way.

**Market Milk and Cream.**—All dairymen supplying milk or cream to any city or town are invited to exhibit milk or cream or both.

The scoring of milk and cream will be done on the basis of score-cards, in the following manner:

**Market Milk.**—Flavor, perfect, 40 points. It should be rich, sweet, clean, and pleasant, without any objectionable flavor or

odor. Composition, perfect, 25 points. It should contain 4 per cent of fat or above and 8.5 per cent solids not fat or above for a perfect score. Bacteria, perfect, 20 points. It should not contain more than 10,000 bacteria per cubic centimeter, and there should not be any unusually large number of putrefactive bacteria for a perfect score. Deduction of score will be made according to the total number of bacteria and the number of putrefactive bacteria. Acidity, perfect, 5 points. It should not show the acidity of over 0.2 per cent for a perfect score. Appearance of package and contents, perfect, 10 points. The package should be clean, free from metal parts, and no foreign matter should be detected in the contents.

*Market Cream.*—Market cream will be scored much the same as market milk, with the exception of composition. To get a perfect score, the cream must contain 20 per cent of fat or above.

*How to Compete.*—Milk or cream to compete for a prize must be sent by express prepaid or otherwise to the Dairy Department of the Kansas State Agricultural College, Manhattan, Kan. The package should be plainly addressed on the outside; a card should also be tacked on the inside of the box, giving plainly the sender's name and address, so as to avoid mistakes in identifying packages. In order that the milk or cream entered by the exhibitors may be of the same age when scored, it shall be drawn from the cow on Thursday, December 24, and shipped as soon thereafter as possible. The exhibitors must send two quarts of milk, or two pints of cream, placed in a box suited for shipping. Every exhibitor is required to write to the Dairy Department of the College, at the time the milk or cream was shipped, stating when and where the milk or cream was shipped, and how it was produced and handled previous to shipping. All producing milk, cream or butter should know definitely the quality of the produce, and these contests will lend the opportunity of having the product criticised by experts.

If further particulars are desired, write the Dairy Department of the Kansas State Agricultural College.

SUCCESS does not come from money, or family, or pull, or luck; but from brains, and training, and everlasting hard work.

*The Art of Dress.*

The art of being well dressed does not depend upon whether a dress is custom made or ready made. It depends upon wearing clothes that look well, all things considered, when they are worn.

Good dressing is as much a branch of education as are the languages or the many serious arts which require study and effort to learn. Ruskin says: "The splendor and phantasy of dress were, in the early days, studied for love of their true beauty and honorableness, and became one of the main helps to dignity of character and courtesy of bearing."

The most important point in the good dressing of a woman is that she should use her own good taste, study the lines of her own figure, make her fashions to suit herself, and still keep within the prevailing modes. Simplicity is the key-note of the wardrobe of the really well-dressed woman.

The woman of very moderate means living on a farm or in a small village, or the woman anywhere who is doing her own work, need not deny herself all the dainty adornments of dress in which her city sister revels. Every woman has a right to the greatest amount of beauty and luxury she can have without sacrificing others to procure it. But she ought not to wear soiled and ragged finery about her domestic duties, but she will, if she is sensible, have first of all as many as she can afford of the garments which are best fitted to her work, as washable dresses of percale and gingham, with skirts that escape the floor, and plenty of aprons.

Furthermore, she chooses for church or visiting the hat and dress which will be as pretty and becoming as possible. Simple things perfectly fitted, properly worn and exquisitely cared for are the insignia of the really well-dressed woman. Garments that are appropriate to their age and station are those which add beauty and attractiveness.

It would seem to be the duty of the mother of children, especially of sons, to dress well and look her best. She should be ideally beautiful to them, and farthest removed from dowdiness. A loving pride comes readily to the eyes of the son who fancies his mother is the most tastefully gowned, the most delightful to look at, the most charming woman in all his world. Every one who adds beauty to goodness makes goodness doubly dear.

The most important quality of a dress is its color. Such tints as best show off complexion, hair and eyes as they are to-day are to be chosen, and not such as were becoming in the past. The sense of color in clothes is really a gift, and one that is indeed rare.

The love of dress, of color, of choice fabrics, of ornament, is

evidence of the desire of the human mind to realize an ideal of excellence.

The whole secret of dressing the woman who has too much *avoirdupois* is to balance the figure. There must be fullness about the feet, and it must begin to flare gradually below the hips. The lines should run vertically and not horizontally in the design, and there should be many of them.

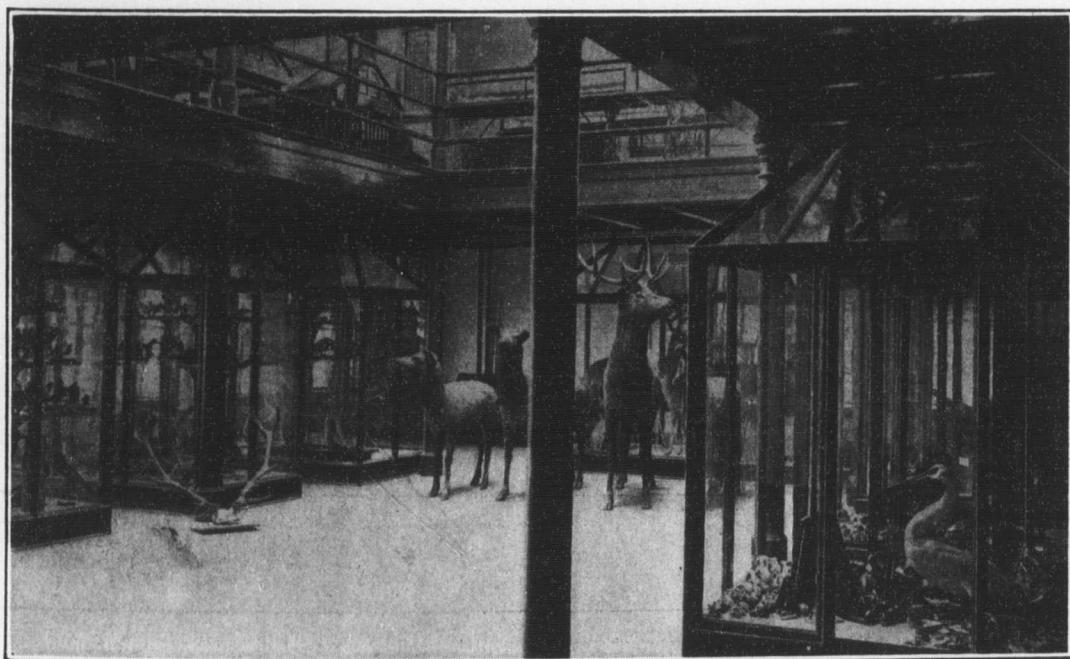
The gratification of a womanly instinct, ease, freedom from self-consciousness, vigor of body and mind, grace of motion, beauty of appearance and courtesy of bearing depend in large measure upon appropriate and attractive clothing.

The study of the relations of line and form, color and complexion, opens to the learner delightful possibilities of enjoyable achievement beyond all comparison with an unreasonable imitation of prevailing fashion. The gown that is becoming, suitable and comfortable one season will be the same during another.

As womankind is beginning to realize the importance of art in dress and to appreciate the bearing it may have upon her comfort and happiness, and upon the comfort and happiness of those dear to her, many schools and colleges are giving courses along this line.

Since our new Domestic Science and Art Hall has been completed, excellent opportunities are afforded for work in domestic art.

ANTONETTA BECKER.



Museum of Natural History.

**A List of the Premiums, State Farmers' Institute Exhibit.****CLASS A.—BEST TEN EARS, YELLOW CORN.**

|                                                                                                                              |         |
|------------------------------------------------------------------------------------------------------------------------------|---------|
| First Premium.—Black Hawk corn-planter, donated by D. M. Sechler Carriage Company, Moline, Ill.....                          | \$42 00 |
| Second Premium.—One hundred and fifty pounds of choice alfalfa seed, donated by Ross Bros. Seed Company, Wichita, Kan.....   | 25 00   |
| Third Premium.—Ten dollars cash and grain grader, double screen, donated by Chas. Hunnicutt Company, Wilmington, Ohio.....   | 15 00   |
| Fourth Premium.—Three bushels Reid Yellow Dent seed-corn, donated by S. G. Trent, Hiawatha, Kan.....                         | 9 00    |
| Fifth Premium.—One-year subscription to Topeka <i>Daily Capital</i> and five-year subscription to <i>Kansas Farmer</i> ..... | 8 00    |

**CLASS B.—BEST TEN EARS, WHITE CORN.**

|                                                                                                                               |       |
|-------------------------------------------------------------------------------------------------------------------------------|-------|
| First Premium.—Deere No. 9 Edge Drop corn-planter, donated by John Deere Plow Company, Kansas City, Mo.....                   | 42 00 |
| Second Premium.—One hundred and fifty pounds of choice alfalfa seed, donated by J. G. Peppard Seed Company, Kansas City, Mo.. | 25 00 |
| Third Premium.—Ten dollars cash and grain grader, double screen, donated by Chas. Hunnicutt Company, Wilmington, Ohio.....    | 15 00 |
| Fourth Premium.—Three bushels Boone County White seed-corn, donated by S. G. Trent, Hiawatha, Kan.....                        | 9 00  |
| Fifth Premium.—One-year subscription to Topeka <i>Daily Capital</i> and five-year subscription to <i>Kansas Farmer</i> .....  | 8 00  |

**CLASS C.—MIXED CORN.**

|                                                                                                                                                                |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| First Premium.—Ten bushels choice Red River Ohio seed potatoes, donated by G. T. Fielding & Sons, Manhattan.....                                               | 15 00 |
| Second Premium.—One-year subscription to Topeka <i>Daily Capital</i> and double screen grain grader, donated by Chas. Hunnicutt Company, Wilmington, Ohio..... | 8 00  |

**SWEEPSTAKES.**

|                                                                                                          |         |
|----------------------------------------------------------------------------------------------------------|---------|
| First Premium.—Cash.....                                                                                 | \$10 00 |
| Second Premium.—One bushel of choice alfalfa seed, donated by G. T. Fielding & Sons, Manhattan, Kan..... | 12 00   |
| Third Premium.—Chatham corn grader, donated by Manson-Campbell Company, Ltd., Kansas City, Mo.....       | 10 00   |
| Fourth Premium.—Five dollars cash and a ham, donated by Allingham & Beattie, Manhattan, Kan.....         | 8 00    |
| Fifth Premium.—One ton of coal, donated by S. N. Higinbotham, Manhattan, Kan.....                        | 5 00    |

**ACRE YIELD AND QUALITY CONTEST.***Any "pure-bred" variety.*

The following awards by the National Corn Exposition will be made in the "Acre Yield and Quality" contest, for yields determined at the Omaha National Corn Show, if the corn is again exhibited at the Kansas State Corn Show:

For the largest sworn yield per acre of air-dry corn and the best thirty-year sample of corn grown on such acre, premiums will be awarded as follows: First, \$50; second, \$40; third, \$30; fourth, \$25; fifth, \$15; sixth, \$12; seventh, \$10; eighth, \$7.50; ninth, \$5; tenth, \$2.50.

**BOYS' CONTEST.—BEST TEN EARS OF CORN.**

|                                                                                   |         |
|-----------------------------------------------------------------------------------|---------|
| First Premium.—Fifty dollars cash, donated by Mr. Arthur Capper, Topeka, Kan..... | \$50 00 |
|-----------------------------------------------------------------------------------|---------|

|                                                                                                                                       |       |
|---------------------------------------------------------------------------------------------------------------------------------------|-------|
| Second Premium.—No. 1 Farm fanning-mill, with corn grader attachment, donated by A. P. Dickey Manufacturing Company, Racine, Wis..... | 39 00 |
| Third Premium.—Cotton King Reversible disk harrow, donated by the International Harvester Company, Topeka, Kan.....                   | 26 00 |
| Fourth Premium.—One hundred and fifty pounds choice alfalfa seed, donated by Manglesdorf Bros. Seed Company, Atchison, Kan....        | 25 00 |
| Fifth Premium.—Fifteen dollars cash and five-dollar dish, donated by O. W. Holt, Manhattan, Kan.....                                  | 20 00 |
| Sixth Premium.—Cash.....                                                                                                              | 12 50 |
| Seventh Premium.—Double-barreled shot-gun, donated by the E. B. Purcell Trading Company, Manhattan, Kan.....                          | 12 50 |
| Eighth Premium.—Two bushels of pure-bred seed-corn, donated by J. M. Gilman, Leavenworth, Kan.....                                    | 10 00 |
| Ninth Premium.—Cash .....                                                                                                             | 5 00  |
| Tenth Premium.—Merchandise, donated by Spot Cash Store, Manhattan, Kan.....                                                           | 5 00  |
| Eleventh Premium.—One pair of full vamp shoes, donated by The Leader, Manhattan, Kan.....                                             | 3 75  |
| Twelfth Premium.—Cash.....                                                                                                            | 2 50  |
| Thirteenth Premium.—One pair of buggy dusters, donated by H. A. Elias, Manhattan, Kan.....                                            | 2 00  |
| Fourteenth Premium —Cash.....                                                                                                         | 1 00  |
| Ten Premiums.—Each one-year subscription to <i>Wallace's Farmer</i> , Des Moines, Iowa.                                               |       |
| Ten Premiums.—Each one-year subscription to <i>Orange Judd Farmer</i> , Chicago, Ill.                                                 |       |
| Five Premiums.—Each one-year subscription to <i>Mail and Breeze</i> , Topeka, Kan.                                                    |       |
| Five Premiums.—Each one-year subscription to <i>Kansas Farmer</i> , Topeka, Kan.                                                      |       |
| Five Premiums.—Each one-year subscription to <i>Farm and Stock</i> , St. Joseph, Mo.                                                  |       |
| Five Premiums.—Each one-year subscription to <i>Breeder's Special</i> , Kansas City, Mo.                                              |       |
| Five Premiums.—Each one-year subscription to <i>Farmers' Review</i> , Chicago, Ill.                                                   |       |

### ***Mixed Feed and the Kansas Feeding-Stuffs Law.***

Mixed feeds have always been the medium through which the most flagrant frauds in the feeding-stuffs business have been perpetrated. Oat hulls, rice bran, ground corn-cobs, and other waste products of little or no feeding value have been systematically incorporated in such feeds. The value of mixed feeds cannot be estimated by a purchaser with much assurance of satisfactory results. In the case of pure feeds, the consumer can, to a degree, judge for himself, notwithstanding the considerable variations to which even they are subject in respect to composition and, consequently, feeding value. Mixed feeds have therefore always come under feeding-stuffs laws and have, indeed, received special attention.

The Kansas law requires that feeding-stuffs that have been subjected to any mixing process, or subjected to any process whereby the character of the original material is altered, shall be registered with the Director of the Experiment Station if sold, offered for sale or held for sale within the State of Kansas. It further provides that every sack or other package held for

sale or sold within the State shall bear a distinct brand and conspicuous label in the English language, which shall state the name of the manufacturer or seller, the registered name, trade-mark or other designation of the feed, the net weight of the package, and a guaranty as to the percentage of fat and of protein.

It must be distinctly recognized that this provision has no bearing upon mixtures made for one for his own use, whether the user mixes the feed with his own hands, has it done by his hired man, or orders it done by a dealer. A consumer may, for his own use, order any mixture whatever made by a dealer, and the law has no application to the transaction. If he is feeding a ration to his animals he is thus able to modify it at any time and in any way that he sees fit. The law hampers him in no way whatever as long as the mixture made is not offered for sale.

While dealers are thus permitted to mix feeds in any way that may be wished by a purchaser upon his special order, he has no right to anticipate orders and mix feeds in advance, holding them in stock until purchased. Any mixture of feeds thus kept on hand by a dealer is subject to all of the provisions of the law as designated above.

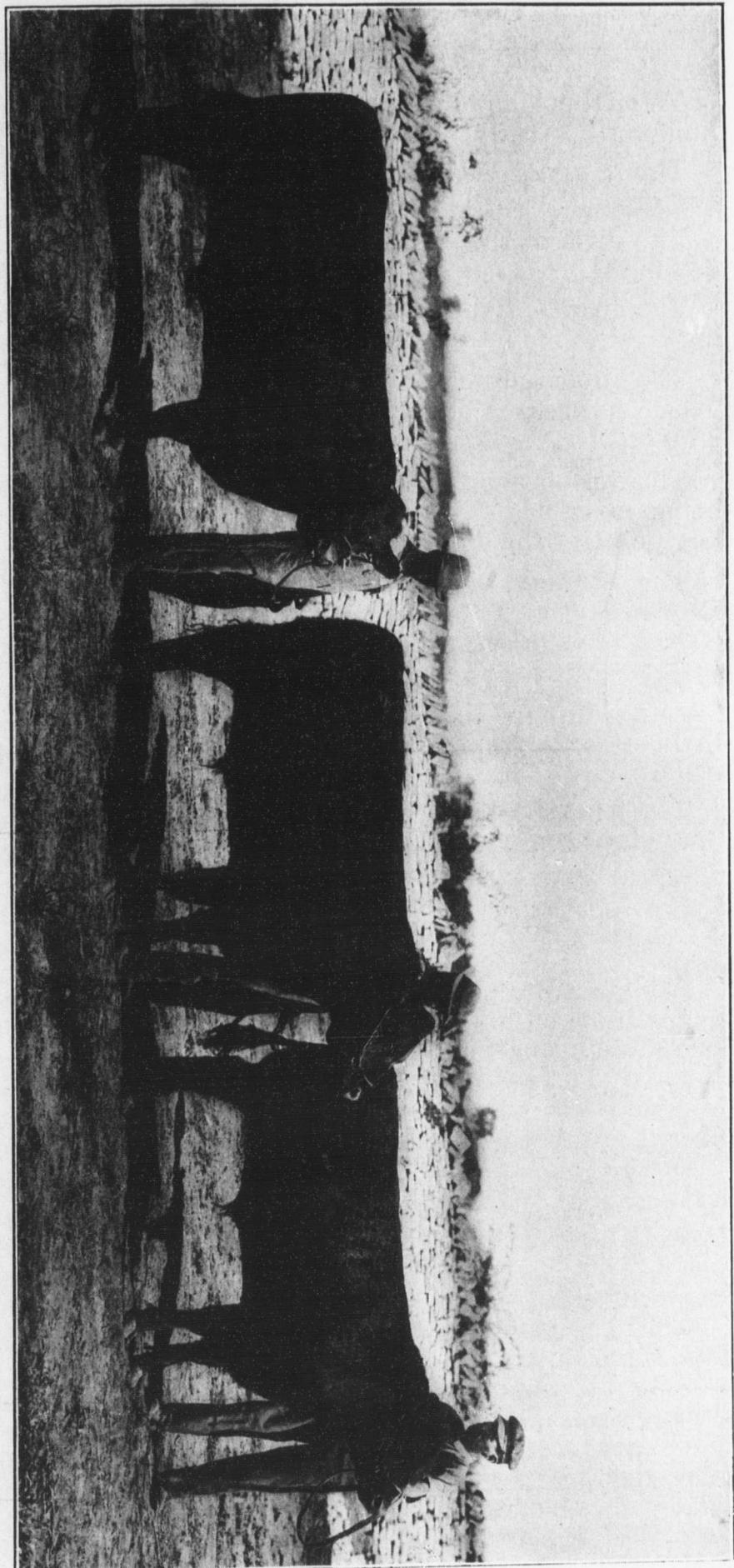
Attention may be drawn to the fact that wheat bran mixed with wheat screenings, corn bran or other foreign substances must be regarded as a mixed feed, and its manufacturers are required to comply with the law as applied to mixed feeds. So, too, corn bran may not be mixed with corn-chop without subjecting it to all of these provisions.

A clear recognition of the provisions of the law and rulings thereunder on the part of both dealers and consumers will, it is believed, enable business to be done in accordance with the law and with a minimum of annoyance and expense consistent with protection from fraud. As with all laws, however, the honest and upright are in part obliged to bear the trouble and cost of restraining the dishonest and fraudulent. J. T. WILLARD.

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During the past four years the Agronomy Department has distributed over 4000 bushels of seed wheat in Kansas and has sent small shipments to Australia, Russia, Italy, China, Japan, and Germany, and to several of the countries of South America.

To the average mind money is synonymous with happiness; there is no appreciation that a rich man can be miserable,—a "brilliant inutility"  
— "a successful failure."



IDEAL.

WINFIELD.

SYMBOLEER.

The group of steers shown above was first-prize herd of pure-bred Aberdeen-Angus steers at the International Live Stock Show in Chicago this year. This herd may well be called an all-star group. Two years ago the steer Ideal won first place as a calf in a hotly contested ring. The following year he was forced to second place, and this year was again first in his class, defeating the steer Fyvie Knight, that later, under the English judge, became grand champion steer of the show. Ideal's cash winnings at the Chicago show alone have amounted to \$330. The steer Winfield was first prize Angus steer calf at Chicago in 1907, and the calf Symboleer won first place in his class this year and afterwards became champion steer calf of the show, all breeds, grades and crosses competing. His cash winnings amounted to \$195. This record has never been equalled by any college or individual showing at the International Live Stock Show.

**Local Notes.**

The Athenians have a new bulletin-board in the hall of the Main building.

The *Students' Herald* publishes a good half-tone of Prof. J. V. Cortelyou.

The girls of the Y. W. C. A. House had a Christmas tree Monday night.

The next number of the Society Lecture Course will be a reading entertainment by Miss Elma B. Smith, on January 7.

The multitudinous accomplishments of that Manhattan professor impresses one that his name ought to be Twenty Eyck.—*Minneapolis Messenger*.

The fan blower for the new blacksmith-shop has arrived and is being installed. The shop will be ready for class work at the beginning of the winter term.

The *Students' Herald* published a special football number on December 16. It is a typographic beauty and full of timely articles on the subject of College athletics.

The students of the Domestic Science Department served a "sample dinner" to the visiting senators and representatives and their escorts from Manhattan and the College last Wednesday noon.

The Alpha Beta society met in the Women's Gymnasium last Saturday evening to have an interview with old Santa Claus.

Er theilte jedem eine Gabe—  
Dem Früchte, jenem Blumen aus.  
Der Jüngling wie der alte Knabe—  
Ein jeder gieng beschenkt nach Haus.—*Schiller*.

Assistant Brandt, of the Department of Architecture and Drawing, will spend his vacation in Guffey, Col., where he will examine some mining properties for the Howell Mining and Milling Company, of Lawrence, Kan. The company has liberally provided him with transportation and all the other "paraphernalia" that make a scientific vacation trip agreeable.

The College football team made an interesting experiment this fall with a training table. They made arrangements at the Y. M. C. A. hall for a "diet board," and later transferred this boarding place to the home of Mrs. Thoes. The idea was to give the men the most nourishing and digestable board that could be obtained. The men paid regular board, three dollars a week, and the Athletic Association added a dollar and a half extra. The gains in weight were astonishing. Randels gained 13 pounds; Hunter, 13; Zoller, 20; Ostlund, 15; Towler, 15; Bates, 12; Croyle, 3; Hinrich, 2; Gingery, 10; Sims, 0. The four men of the team not on the table made an average gain of only a little over 4 pounds. Coach Ahearn is certain that the table had much to do with the splendid record of the team during the season, and that the extra \$170 which the board of the team has cost was well spent.

At the invitation of the Manhattan Commercial Club, a number of senators and representatives of the fifth congressional district visited College last Wednesday to study its financial needs in order to adjust the required appropriations at the coming session of the State legislature. The members present were Senators F. H. Quincy, of Salina, and P. C. Hostrup, of Manhattan, and Representatives J. H. Kuoni, of Marysville, J. T. White, of Ada, J. W. Burke, of Salina, and E. W. Westgate, of College Hill. The gentlemen, in company with President Nichols and several of the professors, visited the different departments and discussed their future needs.

In the students' grain-judging contest at Omaha our team captured two out of the four prizes offered. The wheat- and oat-judging teams consisted of the following members: L. C. Aicher, C. G. Boyle, H. L. Cudney, Guy Noel, and G. H. Brown. This team captured the wheat trophy in defeating Missouri by 84 points and Iowa by 93 points. L. C. Aicher also received the highest number of points of any person of the three teams in this contest. In oat judging our team held second place, with Iowa first. In corn judging J. G. Troutman took the place of L. C. Aicher in the above team. G. H. Brown, one of the members of our team, received the highest number of points in this class, but the team was defeated only two points by Missouri and eighteen points by Iowa. G. Homer Brown also received a \$50 gold watch on scoring the highest number of points in the three contests. C. S. Knight, who trained the boys for this work, is very well satisfied with the results, and in the next year's contest he expects to bring back even more honors for the boys. The following is the placing by states of the first eight places in the three contests: Wheat.—Kansas, 1st, 2nd, 3rd, 5th, 7th; Missouri, 4th, 8th; Iowa 6th. Oats.—Iowa, 1st, 2nd, 4th, 5th, 7th; Kansas, 3rd, 6th, 8th. Corn.—Kansas, 1st; Missouri, 2nd; 8th; Iowa, 3rd, 4th, 5th, 6th, 7th.—*Republic.*

#### *Alumni and Former Students.*

Dr. C. D. Blachly [1902] and Miss Lucile Agnes Spire, of Hewins, came over Saturday to Independence shopping and while here were united in marriage, and greatly surprised the young people on their return Sunday. The Doctor has a good practice in that vicinity and the bride is a well known and popular young lady.—*South Kansas Tribune, December 9.*

All Riley county people who remember Tom Lyon, and there are scores of them, will be glad to know that he has just been elected to the legislature from the Springfield, Ill., district, Abraham Lincoln's old district, by the largest vote ever received there by a candidate for the legislature. That is not all the good luck that has come Tom's way, either. His third boy arrived on the 29th of last month and his law practice is growing big. Tom is strictly a Riley county product, a member of the class of '93, and has hosts of old friends here who are mighty glad to know that he is reaping the success he should have.—*Republic.*

Kansas State Agricultural College  
Manhattan, Kansas

## State Farmers' Institute

December 28, '08, to January 2, '09

Stock and Stock Judging  
Corn and Corn Judging  
Poultry and Poultry Judging  
Dairy and Dairy Testing  
Cooking and Sewing

8 to 12 a. m. and 1 to 2:30 p. m., Judging, Demonstrations  
and Drill  
2:30 to 5:00 and 7:30 to 10:00 p. m., Lectures

OPEN TO ALL! NO FEE! BOARD REASONABLE!

Fine Exhibit of Draft Horses, Beef Cattle,  
Hogs, and Poultry

Sessions begin at 8 a. m., 1 p. m., and 7:30 p. m.

For further particulars address  
**J. H. MILLER,**  
Superintendent Farmers' Institutes, Manhattan, Kansas

**Kansas State Agricultural College**  
**Manhattan, Kansas**

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**State Farmers' Institute**  
and  
**Allied Conventions**

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**December 28, '08, to January 2, '09**

Kansas Boys' Corn Contest Association  
Kansas Corn Breeders' Association  
Poland-China Breeders' Association  
Duroc-Jersey Breeders' Association  
Berkshire Breeders' Association  
Kansas Draft-Horse Breeders' Association  
Institute Officers' Conference  
Cattle Breeders' Conference  
Kansas Butter-Makers' Convention

**A Strong Program Every Afternoon and Evening**

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**Institute begins December 28 and ends January 2**  
**Come for the First Day and Stay for the Week**

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**Special Speakers.**— All of the speakers for the State Farmers' Institute have not yet been secured, but Supt. J. H. Miller announces now the following list: Ed. H. Webster, W. J. Spilman and A. D. Shamel from the Department at Washington; Prof. H. R. Smith, of the University of Nebraska, Prof. W. J. Fraser and Prof. Wm. Dietrich, of the University of Illinois, Prof. B. F. Mumford, of the University of Missouri. The institute will convene at 2:30 Monday afternoon, December 28, and adjourn at noon on Saturday, January 2.

*Board of Instruction (concluded).*

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THE  
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(Board of Instruction concluded on last page.)

# THE INDUSTRIALIST

VOL. 35.

MANHATTAN, KAN., JAN. 9, 1909.

No. 11

## *The Mechanical Engineering Buildings.*

The legislature of 1907 appropriated the sum of eighty-five thousand dollars for a mechanical engineering building, shop additions, and boiler-room extension. The buildings provided for under this appropriation are now in course of construction and comprise the following:

1. Addition to blacksmith-shop.
2. Addition to foundry.
3. Wash- and locker-room.
4. Extension of carpenter-shop.
5. Addition to pattern-shop.
6. Mechanical engineering laboratory and power plant.

The blacksmith-shop addition is now enclosed and will be ready for use by the opening of school for the winter term. This shop is 50 by 100 feet inside, and will contain thirty-four forges for students' use, one instructor's forge, and one forge for particularly large forgings and for use in connection with a steam hammer. These forges are of the latest type, with forced blast and down exhaust. They contain several features especially designed for this installation. The fire pots were built from designs furnished by the Mechanical Engineering Department.

In one corner of the shop is a concrete pit six feet two inches deep. This pit contains the draft and exhaust fans. The fans are driven by direct connected motors, the motor for the blast fan being eight and one-half horse-power, and for the exhauster twenty-five horse-power. By using direct connected motors for the fans, the use of large belts and long line-shafting will be avoided. There will be not to exceed twenty feet of line-shafting, through which will be driven a drill press, emery wheels, and a grindstone. The absence of belting and use of down draft gives an absolutely clear space from top of forges to roof, which means a gain in lighting of from 50 per cent to 100 per cent over that obtained with an overhead installation. The underground air ducts are built up of concrete. Concrete is preferable to metal because of its durability, and has the advantage over vitrified tile in its

freedom from joints, and in the fact that changes in cross-section are gradual, not abrupt.

What to the general visitor is probably the most striking feature of the construction is the roof, which is of the saw-tooth type. This type of roof is now in general use in most power plants and factories throughout the country where ground space permits of one-story construction. It is the best construction known to engineers for securing a light that is bright and at the same time uniformly diffused and without shadows. This roof is always constructed so that a section of it viewed from the east or west has the appearance of a saw with the teeth pointing upward. The south slopes are at an angle of about eighty degrees with the vertical, and the north slopes at about ten. The south slopes are covered with any desired roofing material. The north slopes are of glass, usually clouded, and preferably ribbed to diffuse the light.

The foundry addition contains an iron foundry, brass foundry, core room with ovens, cleaning and plating room, and a shop lecture room or amphitheatre. The latter is believed to be an innovation, but is considered very desirable. It has a seating capacity of eighty. The seats are arranged in semicircles, and each row is raised above the row in front. In addition to the seats, the room will contain a molding bench, with appliances, a forge with anvil and tools, and a blackboard. Being located between the blacksmith-shop and foundry, it is readily accessible to either. The foremen of these shops will take their classes into this room for instruction and thereby avoid the confusion incident to the crowding of the students about the instructor's forge or bench out in the shops. The blackboard will permit the instructor to illustrate and explain many of the appliances used in the trades. This should be of great value to the student, as it is possible for the College to own but a very small per cent of the machines and appliances in daily use in manufacturing, and with which the graduates should be familiar.

The wash- and locker-room addition is two stories in height. The first floor is to be supplied with the latest sanitary equipment and will have 244 individual lockers for students' use. These lockers are of sufficient size to accommodate two students to the locker if necessary. The second floor of this addition contains the shop offices.

The additions to the carpenter- and pattern-shops are two stories in height and are similar in construction to the present north carpenter-shop addition. Space will be provided for about

twenty more students in each carpentry section. It is not the intention to increase the size of the present sections in pattern-making, but to provide room for a more varied equipment. Several appliances, usually found in college pattern-shops, have not yet been supplied through lack of room to use them. The second floors of these additions contain two recitation rooms and an extension of the drafting-room.

Of the entire appropriation, about two-thirds will be used for the mechanical engineering laboratory and power plant. This building, which is now well under way, is 200 by 113½ feet, and in height is equivalent to two stories and a basement. The roof is of the saw-tooth type, but viewed from the east or south sides the appearance is that of a mansard roof. The exterior walls are of cut stone, in caps, jambs and pilasters, and ranged rubble in the curtain walls.

Before the interior arrangement was finally decided upon, various college and commercial plants were visited. At many of the schools, engineering buildings were found that were architecturally beautiful, substantially constructed, and conveniently arranged as respects the recitation rooms and offices, but were sadly lacking in facilities for laboratory instruction and testing and for giving the students a working knowledge of commercial engineering construction, methods, and apparatus, a knowledge which so many engineering graduates lack, and in consequence are handicapped in future professional work. At some places, notably the Universities of Illinois and Ohio, were found buildings that were designed especially for engineering laboratories. Many details of construction and arrangement in the buildings at these universities and of the various power plants that were visited have been used in the mechanical engineering laboratory. The result is a building that, if properly equipped, will be one of the most complete and efficient laboratories in the country. No attempt has been made to construct a general-purpose building. In fact, it would be almost valueless for any purpose other than that for which it was designed.

In the north bay of the building will be located the power and laboratory boilers, coal and ash conveying machinery, and mechanical draft apparatus, together with the appliances for coal and boiler testing. The gas producer, situated just outside the building, will be operated and experimented upon in connection with the appliances in this bay.

The next bay, 75 by 113½ feet, will contain the steam- and gas-engines, steam-turbine, air and ammonia compressors, generators

and switch-boards furnishing power and light to the College, and smaller apparatus for conducting tests in thermodynamics. If space permits, the hydraulic laboratory also will be in this bay. The main floor of this room will be at the level of the present shop floor. Under this is a ten-foot basement containing condensers and similar equipment. Above the main floor, at a height corresponding to that of a second floor, is a gallery which will be used for the lighter experimental work.

The third bay contains the power transmission and strength of materials laboratories. This bay is open from the basement floor to the roof except for two floors of balconies. This construction permits the testing of vertical drives thirty feet or more in height and similar installations, also the testing of columns twenty-five feet long. An amphitheatre or lecture-room occupies one-quarter of this bay. This room has a seating capacity of 120 and is so arranged that machines as large as a thirty-horse-power traction-engine may be brought in and demonstrated or tested.

The south twenty-five feet of the building contains: (1) In the basement, toilet and locker rooms, small laboratories, and rooms for the preparation of test specimens. (2) On the first floor, main entrance and stairway, offices, and recitation room. (3) On the second floor, drafting and blue-print rooms. These extend out over the amphitheatre, and have a width of fifty feet instead of twenty-five.

As large as the mechanical engineering building is, it is hoped that it will eventually be but a wing of a main Mechanics Arts building situated west and slightly south of it, and to which will be added other wings for civil and electrical engineering, architecture, and such other departments as may be added from time to time.

E. B. MCCORMICK.

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Among the meetings that were held during the State Farmers' Institute was the Kansas Draft Horse Breeders' Association. A special committee, consisting of Prof. R. J. Kinzer, of the College, Senator H. W. Avery, of Wakefield, and J. T. Gifford, of Beloit, was appointed to bring this matter before the legislature to the end that a State commission shall be appointed whose duty shall be to inspect all stallions used for public service and certify as to their breeding, soundness, and condition, no stallion to be used for public service without such certificate, a copy of which shall be posted on the door of the barn where the stallion is kept.

*The State Farmers' Institute.*

The State Farmers' Institute, held at the Agricultural College in Manhattan from December 28, 1908, to January 2, 1909, was easily the most successful yet held. The program was rather more continuous this year, and only a few allied associations were invited to meet with the institute. The thought all through was "breeding up" the corn, poultry, wheat, stock, etc.; the mixing of brains with all farm work.

The boys' corn contest rules provided that only winners in the home contest (A class) could enter the State contest, and hence of the 2000 A class boys only about 400 came to the State meeting and 188 brought corn for the contest. It made a good display, and with the fine display made by the Corn Breeders' Association it showed that Kansas men and boys can grow good corn.

The addresses made by Professors Shamel and Spillman, of the Department of Agriculture, were very instructive and interesting. The Corn Breeders' Association brought out a lot of the leading corn breeders, and J. G. Haney, of Oswego, was elected president and Prof. L. E. Call was reelected secretary.

The boys' corn was judged by Mr. J. G. Haney, of Oswego, and Mr. Arnold Martin, of Dubois, Neb. The College and the Corn Breeders' Association members are very grateful to the generous donors for their prizes for the contests, and we are sure those who received the prizes appreciate both the prizes and the spirit that prompted the donors.

The poultry division had about 40 regular attendants every day, the dairy division had an enrolment of about 30, and there were over 50 ladies and girls to take the women's work. This was very encouraging, and a much larger attendance may be expected next year.

The Monday and Tuesday programs were on plant breeding, the Wednesday program was the finest dairy program ever given at any State institute, and on Thursday afternoon the addresses of Prof. H. R. Smith, of Nebraska, and Prof. F. B. Mumford, of Missouri, and the paper by Doctor Schoenleber were well worth going far to hear. On Thursday evening Mr. P. M. Speicher, of the Good Roads Division, Washington, D. C., and Mr. L. C. Miller, of the Forest Service, spoke as did also Professor Mumford. On Friday afternoon and evening the subject was "swine," and it was practical and very interested to old and young.

Altogether the attendance was slightly over 600 men, women, boys, and girls, only three or four under fourteen years of age. Next year the limit will be fifteen years.

On Wednesday, Thursday and Friday about 60 farmers' institute delegates met in conference from 1:00 to 2:30, discussing many things relating to institute work. They recommended (1) raising the age limit in the corn contest, 10 to 15 and 15 to 21; (2) a special corn contest class for all boys who have ever attended a State institute; and (3) all boys above 15 years of age to plant 12 ears of corn next year.

The following premiums were awarded:

BOYS' CONTEST, BEST TEN EARS OF CORN.

Rank, 1; name, Paul Gilman, Leavenworth; premium, \$50 cash; donor, Arthur Capper, Topeka.

Rank, 2; name, Oaklan Snyder, Hiawatha; premium, fanning mill with grading attachment; donor, A. P. Dickey Mfg. Co., Racine, Wis.; value, \$39.

Rank, 3; name, Edgar Cox, Overbrook; premium, Cotton King reversible disk harrow; donor, International Harvester Co., Topeka; value, \$26.

Rank, 4; name, Lloyd Swihart, Lovewell; premium, 150 pounds choice alfalfa seed; donor, Manglesdorf Bros. Co., Atchison; value, \$25.

Rank, 5; name, Frank Coffman, Manhattan; premium, \$15 cash and \$5 dish; donor, cash by Association, \$5 dish by O. W. Holt, Manhattan; value, \$20.

Rank, 6; name, Lloyd Cochran, Topeka; premium, \$12.50 cash.

Rank, 7; name, Edward Leigh, Hanover; premium, double-barrel shotgun; donor, Purcell Trading Co., Manhattan; value, \$12.50.

Rank, 8; name, Herbert Raymer, Louisburg; premium, two bushels pure-bred seed-corn; donor, J. M. Gilman, Leavenworth; value, \$10.

Rank, 9; name, Stewart Maley, Cawker City; premium, \$5 cash.

Rank, 10; name, Ned Brown, Larned; premium, merchandise; donor, Spot Cash Store, Manhattan; value, \$5.

Rank, 11; name, J. E. Willis, Manhattan; premium; one pair full vamp shoes; donor, The Leader, Manhattan; value, \$3.75.

Rank, 12; name, A. C. Christopherson; premium, \$2.50 cash.

Rank, 13; name, Henry Olsen, Baker; premium, Pair buggy dusters; donor, H. A. Elias, Manhattan; value, \$2.

Rank, 14; name, Robert B. Shannon, Hiawatha; premium, \$1 cash.

Rank, 15 to 24; one-year subscription to *Wallace Farmer*, Des Moines, Ia., to the following: August Angler, Topeka; Clarence Granfield, Mayo; Chas. Kieffer, Clifton; Bert Banks, Cawker City; Abner Lundquist, Lindsborg; Henry Leigh, Hanover; Albert Dieball, Alma; Ora Wolf, Uniontown; Leslie Milligan, Clay Center; Carley Parr, Rossville.

Rank, 25 to 34; one-year subscription to *Orange Judd Farmer*, Chicago, Ill., to the following: Harmon Williams, Wellington; Ralph Gilman, Leavenworth; Titus Bowser, Larned; Lowell Manchester, Paola; Seldon Bowman, Topeka; Newton Kern, Louisburg; Geo. Bennett, Lovewell; Ralph Hutchinson, Bellaire; Carl Rhodes, Hiawatha; Ira Wood, Silver Lake.

Rank, 35 to 39; one-year subscription to *Mail & Breeze*, Topeka, to the following: Merrill Hamm, Holton; Fred Kohler, Paola; Ernest Resser, Rossville; Mark O'Connell, Oswego; Leon Pearson, Ackerland.

Rank, 40 to 44: one-year subscription to *Kansas Farmer*, Topeka, to the

following: Edgar Chase, Hiawatha; Myron Johnson, Ogden; Geo. Bell, Effingham; Harold Cellars, Topeka; Lannes Long, Drexel, Mo.

Rank, 45 to 49; one-year subscription to *Farm & Stock*, St. Joe, Mo., to the following: Lester Mack, Onaga; Loren Cockrell, Oswego; Will Dodson, South Haven; Rueben Snapp, Belleville; Herbert Green, Olathe.

Rank, 50 to 54; one-year subscription to *Breeders' Special*, Kansas City, Mo., to the following: Hurman Blume, Wamego; Mike Kesler, Rossville; Carl Martin, Belle Plaine; Louis Reiser, Wamego; Ethbridge Leggett, Eudora.

Rank, 55 to 60; one-year subscription to the *Farmers' Review*, Chicago, Ill., to the following: Maurice Babb, Wakefield; Joe Babb, Wakefield; Edwin Oyster, Paola; Richard Hoffmeister, Topeka; Geo. Padgett, Kingman.

#### MEN'S CORN CONTEST.

##### CLASS A.—BEST TEN EARS YELLOW CORN.

Rank, 1; name, C. C. Sanford, Oneida; premium, Black Hawk corn planter; donor, D. M. Sechler Carriage Co., Moline, Ill.; value, \$42.

Rank, 2; name, S. G. Trent, Hiawatha; premium, 150 pounds choice alfalfa seed; donor, Ross Bros. Seed Co., Wichita; value, \$25.

Rank, 3; name, Ed. Flaherty, Seneca; premium, \$10 cash and double-screen grain grader; donor, cash by Association and grain grader by Chas. Hunnicutt Co., Wilmington, Ohio; value \$15.

Rank, 4; name, J. T. Martin, Hanover; premium, Reid Yellow Dent seed corn; donor, S. G. Trent, Hiawatha; value, \$9.

Rank, 5; name, L. V. Sanford, Oneida; premium, five-year subscription to *Kansas Farmer* and one-year subscription to *Topeka Daily Capital*; value, \$8.

##### CLASS B.—BEST TEN EARS WHITE CORN.

Rank, 1; name, L. V. Sanford, Oneida; premium, Deere No. 9 Edge drop corn planter; donor, John Deere Plow Co., Kansas City, Mo.; value, \$42.

Rank, 2; name, Peter McQuaid, Seneca; premium, 150 pounds alfalfa seed; donor, J. G. Peppard Seed Co., Kansas City, Mo.; value, \$25.

Rank, 3; name, E. Wilson, Lawrence; premium, \$10 cash and double-screen grain grader; donor, cash by Association and grain grader by Chas. Hunnicutt Co., Wilmington, Ohio; value \$15.

Rank, 4; name, L. M. Gilman, Leavenworth; premium, three bushels Boone County White seed-corn; donor, S. G. Trent, Hiawatha; value, \$9.

Rank, 5; name, F. B. Morlan, Courtland; one-year subscription to *Topeka Daily Capital* and five-year subscription to *Kansas Farmer*; value, \$8.

##### CLASS C.—BEST TEN EARS OTHER CORN.

Rank, 1; name, J. M. Gilman, Leavenworth; premium, ten bushels Red River Ohio seed potatoes; donor, G. T. Fielding & Sons, Manhattan; value, \$15.

Rank, 2; name, Ray Gilman, Leavenworth; one-year subscription to *Topeka Daily Capital* and double-screen grain grader; donor, Chas. Hunnicutt Co., Wilmington, Ohio; value, \$8.

#### SWEEPSTAKES.

Rank, 1; name, C. C. Sanford, Oneida; premium, \$10 cash; donor, Association.

Rank, 2; name, L. V. Sanford, Oneida; premium, one bushel choice alfalfa seed; donor, G. T. Fielding & Sons, Manhattan; value, \$12.

Rank, 3; name, S. G. Trent, Hiawatha; premium, Chatham corn grader; donor, Campbell-Manson Co., Kansas City, Mo.; value, \$10.

Rank, 4; name, Peter McQuaid, Seneca; premium, \$5 cash, and a ham; donor, Allingham & Beattie, Manhattan; value, \$8.

Rank, 5; name, Ed. Flaherty, Seneca; premium, one ton coal; donor, S. N. Higinbotham, Manhattan; value, \$5.

#### SINGLE EAR CONTEST.

Earl Willis, Manhattan, wins the \$50 painting donated by Alfred Montgomery (Chicago), the farm painter, the painting to be contested for each year.

#### FLAHERTY SPECIAL.

Mr. Ed. Flaherty, Seneca, donated five bushels of Reid Yellow Dent corn to be distributed among the second, third, fourth, fifth and sixth premium winners in the boys' class.

#### WICHITA STAR SPECIAL.

The *Wichita Star*, Wichita, has awarded a year subscription to each of the following: Lester Mack, Onaga; Loren Cockrell, Oswego; Will Dodson, South Haven; Rueben Snapp, Belleville; Herbert Green, Olathe; Elmer Hallister, Sedgwick.

#### ACRE YIELD AND QUALITY CONTEST.

The following awards have been made by the National Corn Exposition Management, the samples having been exhibited again at the Annual Meeting of the Kansas Corn Breeders' Association, at Manhattan, Kan. In determining the yields, 40 per cent was allowed for score of the sample exhibited and 60 per cent for yield per acre. Premiums paid by National Corn Exposition, Kansas Commission, and Kansas Corn Breeders' Association.

Rank; 1; grower, S. G. Trent, Hiawatha; variety, Boone county; buyer, Ralph Hull, Manhattan; score, 35.1; yield, 117.57; price, \$10; premium, Male Hog, Berkeley Bros., Louisburg, \$20; three-years' subscription to *Kansas Farmer*, \$2.50; and \$27.50 cash; total, \$50.

Rank, 2; grower, J. M. Gilman, Leavenworth; variety, Boone county; buyer, exhibitor; score, 27.5; yield, 108.60; price, \$7; premium, Male Hog, J. D. Ziller, Hiawatha, \$20; and \$20 cash; total, \$40.

Rank, 3; grower, W. J. Ryan, Leavenworth; variety, Boone county; buyer, Ralph McKinney, Glen Elder; score, 22.5; yield, 96.72; price, \$3; premium, three-years' subscription to *Kansas Farmer*, \$2.50; three-years' subscription to *Mail & Breeze*, \$2.50; three-years' subscription to *Missouri Valley Farmer*, \$2.50; and \$22.50 cash; total, \$30.

Rank, 4; grower, C. C. Mayer, Leavenworth; variety, Boone county; buyer, J. M. Hall, Soldier; score, 25.2; yield, 92.71; price, \$3; premium, two-years' subscription to *Missouri Valley Farmer*, \$1.50; three-years' subscription to *Mail & Breeze*, \$2.50; and \$21 cash; total, \$25.

Rank, 5; grower, J. F. Hutchinson, Leavenworth; variety, Boone county; buyer, C. J. Johnson, Solomon Rapids; score, 30.2; yield, 74.13; price, \$3; premium, one-year's subscription to *Kansas Farmer*, \$1; one-year's subscription to *Mail & Breeze*, \$1; two-years' subscription to *Missouri Valley Farmer*, \$1.50; and \$11.50 cash; total, \$15.

Rank, 6; grower, H. A. Cowles, Sibley; variety, Reid; buyer, Geo. Hall, Manhattan; score, 23.4; yield, 70.16; price, \$2.50; premium, two-years' sub-

scription to *Kansas Farmer*, \$1.50; two-years' subscription to *Missouri Valley Farmer*, \$1.50; and \$9 cash; total, \$12.

## SALE OF PRIZE CORN.

Grower, C. C. Sanford, Oneida; variety, Legal Tender; buyer, J. D. Ziller, Hiawatha; price, \$7.

Grower, S. G. Trent, Hiawatha; variety, Reid; buyer, A. M. Ten Eyck, Manhattan; price, \$4.50.

Grower, L. V. Sanford, Oneida; variety, Sanford's Improved; buyer, by exhibitor; price, \$3.

Grower, Peter McQuade, Seneca; buyer, A. M. Ten Eyck, Manhattan; price, \$1.75.

Grower, Ed. Flaherty, Seneca; variety, Reid; buyer, A. M. Ten Eyck, Manhattan; price, \$5.

Grower, J. M. Gilman, Leavenworth; variety, Wilson's Red; buyer, W. E. Watkins, Anthony; price, \$13.

Grower, E. Wilson, Lawrence; variety, Douglas White; buyer, by exhibitor; price, \$10.

Grower, J. M. Gilman, Leavenworth; variety, Boone county; buyer, R. A. Willis, Manhattan; price, \$5.

Grower, J. M. Gilman, Leavenworth; variety, Bloody Butcher; buyer, E. B. Coffman, Manhattan; price, \$7.

Grower, J. T. Martin, Hanover; variety, Hiawatha; buyer, by exhibitor; price, \$3.

Grower, B. F. Morlan, Courtland; variety, Boone county; buyer, J. B. Brown, Larned; price, \$3.50.

Grower, J. M. Gilman, Leavenworth; variety, Bloody Butcher; buyer, F. A. Coffman, Manhattan; price, \$6.50.

Grower, J. M. Gilman, Leavenworth; variety, Boone county; buyer, J. M. McCray, Manhattan; price, \$5.

Grower, Ray Gilman, Leavenworth; variety, Boone county; buyer, R. G. Campbell, Meriden; price, \$3.50.

Grower, C. C. Sanford, Oneida; variety, Sanford's Improved; buyer, A. M. Ten Eyck, Manhattan; price, \$4.

Grower, A. R. Snapp, Belleville; variety, Calico; buyer, J. W. Johnson, Beloit; price, \$1.

Grower, L. V. Sanford, Oneida; variety, Legal Tender; buyer, A. M. Ten Eyck, Manhattan; price, \$5.

Grower, F. C. Roe, Hiawatha; variety, Reid; buyer, J. B. Campbell, Meriden; price, \$4.50.

Grower, Geo. Flaherty, Seneca; variety, Reid; buyer, J. W. Johnson, Beloit; price, \$5.

Grower, E. W. Snyder, Hiawatha; variety, Reid; buyer, John Dunlap, Eureka; price, \$4.50.

Grower, Oliver Caldwell, Kincaid; variety, Boone county; buyer, C. J. Johnson, Solomon; price, \$2.

Grower, F. A. Ten Eyck, Concordia; variety, Reid; buyer, Lloyd Swihart, Lovewell; price, \$3.

Grower, S. G. Trent, Hiawatha; variety, Boone county; buyer, C. J. Johnson, Solomon Rapids; price, \$3.

Grower, J. D. Ziller, Hiawatha; variety, Hiawatha; buyer, by exhibitor; price, \$2.50.

Grower, F. A. TenEyck, Concordia; variety, Boone county; buyer, by exhibitor; price, \$3.50.

Grower, W. O. Bearamore, Concordia; variety, Sunflower; buyer, by exhibitor; price, \$3.50.

Grower, J. M. Coverts, Stark; variety, Covert White Dent; buyer, Riley Welch, Lyons; price \$2.

Grower, R. A. Willis, Manhattan; variety, Boone county; buyer, by exhibitor; price \$2.

Grower, H. Christopherson, Garrison; variety, Reid; buyer, Abner Lundquist, Lindsborg; price, \$2.50.

Grower, Homer Willis; variety, Boone county; buyer, J. A. Parr, Ross-ville; price, \$3.50.

Grower, N. S. Kelsey, N. Topeka; variety, Reid; buyer, T. M. Covert, Stark; price, \$2.

Grower, G. E. Kelsey, N. Topeka; variety, Reid; buyer, G. Merritt, Eureka; price, \$2.

Grower, Lloyd Swihart, Lovewell; variety, Hammett; buyer, Geo. Hall, Manhattan; price, \$1.50.

Grower, Lloyd Swihart, Lovewell; variety, Mo Liza; buyer, by exhibitor; price, \$1.

Several other samples were sold at private sale.

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During the State Farmers' Institute a business meeting of the Kansas Duroc Jersey Breeders' Association was held and new officers elected as follows: President, John W. Jones, Concordia; vice-president, Geo. Kerr, Sabetha; secretary, Grant Gaines, Topeka; directors, Grant Hamm, Holton; Grant Chapin, Green; Geo. M. Hammond, Manhattan; W. C. Whitney, Agra. A committee on entertainment consisting of Grant Hamm, Holton; Ralph Harris, Buck Creek; Prof. R. J. Kinzer, State Agricultural College; J. F. Stodder, Burden; Pearl H. Pagett, Beloit, was appointed to arrange for a program, and a banquet for the 250 Duroc Jersey breeders at the next annual meeting, which will be held in connection with the State Farmers' Institute. It was decided to ask each member of the association to contribute one bred sow or gilt to a big sale to be held here in March. A portion of the proceeds of this sale is to be used by the association in the promotion of its interests and for the holding of a big Duroc exposition. Preliminary to this sale a committee consisting of Prof. R. J. Kinzer, of the Agricultural College, Geo. Hammond, Rudolph Samuelson, and Col. L. R. Brady, all of Manhattan, was appointed.

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The twentieth annual meeting of the Kansas Improved Stock Breeders' Association will be held in the Capital building, Topeka, January 11, 12, and 13, beginning Monday evening, January 11, at 7:30.

***Local Notes.***

Among the members of the Faculty whom the local editor noticed at the State Teachers' Association, at Topeka, were President Nichols, and Professors Willard, McKeever, Kammeyer, Dickens, and Van Zile.

Mrs. Van Zile spent part of her Christmas at her old home in Winfield, Iowa. From there she went to Topeka, where she addressed the State Horticultural Society, and to Manhattan where she assisted in the State Farmers' Institute program.

Professor Olof Valley attended the annual meeting of the National Music Association, at Washington, D. C., during the holidays.

The Animal Husbandry Department sold a Percheron mare and colt last week to L. C. Jennings, of Wamego.

J. A. Gifford, of Milford, one of the progressive horse breeders of Kansas, furnished a three-year-old Percheron stallion and two fillies for judging purposes during the institute week. John Barr, of Westmoreland, furnished two Belgian stallions, and John Peak, of Manhattan, furnished a Percheron.

One hundred twenty-five young women were enrolled in the short course in domestic science last fall term.

Among the many things that interested the visitors at College during the State Farmers' Institute was the milking machine in the dairy barn. Large numbers attended the milking demonstrations every evening.

The Hereford combination sale at the College, December 31, was well attended, but the prices were not as high as had been anticipated. Following is a summary of the sales: 17 bulls \$1275, average \$75; 32 females \$2280, average \$71.25; 49 head \$3555, average \$72.35.

Mr. P. J. Newman, of Franklin, Ind., has been elected assistant in chemistry.

The State-wide institute is a big thing and it is growing. It has demonstrated its right to a permanent home at Manhattan.  
—*Kansas Farmer*.

The thirty-eighth annual meeting of the Kansas State Board of Agriculture will be held January 13, 14, and 15, at Topeka. We notice in the program that the Agricultural College will be represented by Prof. Albert Dickens and Ex-Professor Mrs. Nellie (Kedzie) Jones.

Professor Kinzer went to the Hays Branch Experiment Station, January 2, to look after the cattle and sheep experiments carried on out there. He reports the new cottage finished, the new feeding sheds nearly completed, and the addition to the boarding-house well along.

At the National Dairy Show in Chicago, December 2 to 10, the dairy products exhibited by the College received a favorable mention and were awarded a special medal. The College stood first on the list of agricultural schools. Good for Professor Kendall!

*Alumni and Former Students.*

J. B. Dorman, '96, and Miss Helen Van Allen Knight were married Thursday, December 24, 1908, and are at home at 149 Wardwell Avenue, West New Brighton, Staten Island, N. Y.

W. M. Wright, '87, is now located at Welsh, La. He and Sarah (Cottrell) Wright, '94, have settled on a two-hundred-acre rice farm which, though not ideal as to conditions, he likes better than his recent employment of running a dredge boat.

Mrs. Nellie Kedzie Jones, '76, is on the program of the State Board of Agriculture for Friday evening, January 15. Her subject is "The Great-Granddaughters of Kansas Pioneers." Many will be glad of this opportunity to hear "Mrs. Kedzie" again.

In the corn contest held during the holidays under the auspices of the College, L. V. Sanford, '04, won the fifth premium on ten ears of yellow corn, the first premium for the best ten ears of white corn, and the second sweepstakes premium. F. B. Morlan, '00, won the fifth premium on white corn.

W. T. McCall, '08, and D. L. Orendorff, sophomore last year, after considering several points have decided to locate in Manhattan for the manufacture of the machine which they invented for stacking hay and headed grain. These energetic men have many friends who will look for them to succeed in this enterprise, and rejoice with them in that success.

Harry J. C. Umberger, '05, scientific assistant, office of grain investigations, is one of the authors of circular No. 8, on "The Smuts of Sorghums," recently issued by the Bureau of Plant Industry. It treats in a practical way of the different kinds of smut affecting the sorghums and describes methods of treating the seed for the purpose of limiting the disease.

Mr. and Mrs. Willitt R. Correll arrived Saturday and are the guests of Mr. Correll's parents, Mr. and Mrs. J. M. Correll. The marriage of Mr. Correll ['] and Miss Nettie Kimble occurred December 6, in Abingdon, Ill., and since then they have been the guests of Mr. and Mrs. Frank Uhl, in Kansas City, and of Mrs. Correll's parents in Overbrook, and her sister in Lawrence. They will remain with Mr. and Mrs. J. M. Correll until their new house is completed in the north part of town. Many congratulations.—*Nationalist.*

Changes of address: Fanny G. Noyes, '99, 1458 Wyandotte Avenue, Lakewood, O.; Dalinda (Mason) Cote, '81, 5035 Echo street, Los Angeles, Cal.; M. Josephine Edwards, '05, F. F. Thompson Hospital, Canandaigua, N. Y.; R. A. Fulton and Fanny (Reynolds) Fulton, '05, 10,922 Hampden Avenue, Cleveland, O.; V. M. Emmert, '01, Blue Rapids, Kan.; Ben Skinner, '91, Concordia, Kan.; A. N. H. Beeman, '05, 613 Grand Avenue, Leavenworth, Kan.; C. E. Davis, '06, 104 South Common street, West Lynn, Mass.; F. E. Johnson, '99, Buffalo, N. Y., general delivery; A. R. Snapp, '08, Belleville, Kan.; D. B. Swingle, '00, Experiment Station, Bozeman Mont.

C. G. Elling, '04, who for over a year has been assistant in the Animal Husbandry Department, has resigned his position to take one with a large Cuban company and in which he will be in charge of their large live-stock interests on the Island of Cuba. He was chosen for this position by Prof. F. S. Earle, with whom Mr. Elling worked at the experiment station at Santiago de las Vegas.

The Wabaunsee Alumni Association held its annual reunion Friday, December 18. Over thirty graduates and former students and their wives and husbands were present, eleven being graduates. These included two from Wamego and two visitors from a greater distance. Profs. J. E. Kammeyer and J. T. Willard, '83, were present by invitation and contributed to the speech-making. The chief feature of the reunion was the dinner which, being planned and supervised by alumnae, could not be other than a success. The officers elected for the next year were: President, J. C. Bolton, '99; vice-president, Jennie Cottrell, '04; corresponding secretary, E. L. Cottrell, '99; secretary-treasurer, Anna Smith.

"Poole Bros., of Manhattan, Kan., known all over the State as extensive and successful feeders, concluded to try the Christmas cattle deal this year and were highly satisfied with the results. They fed both steers and cows, five loads of the former and three loads of the latter. Results are what counts with them. The five loads of steers averaged 1593 pounds and sold at \$7. The three cars of cows tipped the beam at 1345 per head and were paid for at the rate of \$5.50 per hundred. Good judgment in selection, system and the best of care, while feeding and good price at time of selling advanced their bank account by a goodly sum as a result of the experiment." This from the *Breeders' Special* refers to John Poole, '96, Wm. Poole, '98, Bryant Poole, '01, and Grover Poole, '02.

Several of the alumni won prizes at the National Corn Exposition recently held in Omaha. The following is believed to be a complete list. J. G. Haney, '99, won the first premium on yellow dent corn, L. V. Sanford, '04, the seventh premium, and W. R. Hildreth, '02, the ninth. In white dent corn Mr. Hildreth won the second premium. In the competition for the best single ear of dent corn of any color, W. R. Hildreth received the fourth premium and L. V. Sanford the eighth. Mr. Haney won the sweepstakes open to winners of first premiums in the Kansas ten-ear corn class. W. R. Hildreth won first place in the Kansas Commission special competition, being between native pure-bred varieties. F. B. Morlan, '00, received the twentieth premium on yellow corn, the fifth on white, and was fourth in the contest among native pure-bred varieties. Premiums were awarded for other grains than corn, and E. G. Schafer, '07, received the highest award for an exhibit of one-half bushel of yellow oats and the second premium on heads of Kafir-corn. H. V. Harlan, '04, was awarded third place on an exhibit of red oats and first place on milo maize. A number of former students not graduates also competed and won prizes.

*Board of Instruction (concluded).*

|                                                                 |                                        |
|-----------------------------------------------------------------|----------------------------------------|
| Miss Ada Rice, B. S. (K. S. A. C.)                              | Instructor in English                  |
| Miss Ella Weeks, A. B. (U. of K.)                               | Instructor in Drawing                  |
| Miss Daisy Zeininger, B. A. (Fairmount)                         | Instructor in Mathematics              |
| Leonard W. Goss, D. V. M. (Ohio State University)               | Instructor in Veterinary Science       |
| Miss Ula M. Dow, B. S. (K. S. A. C.)                            | Instructor in Domestic Science         |
| Theo. H. Scheffer, A. M. (Cornell University)                   | Instructor in Zoölogy                  |
| Herbert H. King, M. A. (Ewing College)                          | Instructor in Chemistry                |
| John B. Whelan, M. A. (Nebraska)                                | Instructor in Chemistry                |
| Louis H. Beall, A. B. (Denison)                                 | Instructor in English                  |
| Roy A. Seaton, B. S. (K. S. A. C.)                              | Instructor in Mechanical Engineering   |
| William L. House                                                | Foreman of Carpenter Shop              |
| Louis Wabnitz                                                   | Foreman of Machine Shops               |
| Miss Ina E. Holroyd, B. S. (K. S. A. C.)                        | Assistant in Preparatory Department    |
| Ambrose E. Ridenour, B. S. (K. S. A. C.)                        | Foreman of Foundry                     |
| Miss Emma J. Short                                              | Assistant in Preparatory Department    |
| Miss Ina Cowles, B. S. (K. S. A. C.)                            | Assistant in Domestic Art              |
| Miss Kate Tinkey                                                | Assistant Librarian                    |
| Earl N. Rodell, B. S. (K. S. A. C.)                             | Assistant in Printing                  |
| M. Francis Ahearn, B. S. (Mass. Ag. College)                    | Assistant in Horticulture              |
| Miss Gertrude Stump, B. S. (K. S. A. C.)                        | Assistant in Domestic Art              |
| M. Sheldon Brandt, Ph. B. (Yale)                                | Assistant in Architecture and Drawing  |
| Chas. Yost                                                      | Assistant in Heat and Power Department |
| Earle B. Milliard                                               | Foreman of Blacksmithing               |
| J. T. Parker                                                    | Assistant in Woodwork                  |
| J. D. Magee, A. M. (Chicago)                                    | Assistant in Mathematics               |
| E. G. Meinzer, A. B. (Beloit)                                   | Assistant in German                    |
| Miss Florence S. Latimer, B. M. (Ferry Hall Seminary)           | Assistant in Music                     |
| Miss Marjorie Russell (Mechanics' Institute)                    | Assistant in Domestic Science          |
| Burton Rogers, D. V. M. (Iowa State College)                    | Assistant in Veterinary Science        |
| Miss Clara Willis (Framingham Normal)                           | Assistant in Domestic Science          |
| C. O. Swanson, M. Agr. (Minn.)                                  | Assistant Chemist, Experiment Station  |
| Edw. C. Crowley, Ph. B. (Yale)                                  | Assistant in Chemistry                 |
| Hugh Oliver                                                     | Assistant in Heat and Power Department |
| Miss Charlaine Furley, B. A. (Fairmount)                        | Assistant in English                   |
| Miss Jessie Reynolds, A. B. (U. of K.)                          | Assistant in Preparatory Department    |
| Miss Mary F. Nesbit, A. B. (Illinois University)                | Assistant in Mathematics               |
| Miss Annette Leonard, A. B. (U. of K.)                          | Assistant in English                   |
| William C. Lane, B. S. (K. S. A. C.)                            | Assistant in Electrical Engineering    |
| Miss Flora C. Knight, A. B. (Uni. of Wyoming)                   | Assistant in English                   |
| Miss Grace H. Woodward (Boston School of D. S.)                 | Assistant in Domestic Science          |
| Miss Nellie Cave, B. M. (Univ. of Nebr.), (Chicago Music Coll.) | Assistant in Music                     |
| Miss Margaret Mack (K. S. N.)                                   | Assistant in Preparatory Department    |
| Edwin G. Schafer, B. S. (K. S. A. C.)                           | Assistant in Agronomy                  |
| Orin A. Stevens, B. S. (K. S. A. C.)                            | Assistant in Botany                    |
| Miss Mary W. Hancock (Mechanics' Inst.)                         | Assistant in Domestic Art              |
| S. W. McGarrah, A. M. (Grove City College)                      | Assistant in Mathematics               |
| Carl G. Elling, B. S. (K. S. A. C.)                             | Assistant in Animal Husbandry          |
| Kirk H. Logan, B. S. (U. of K.)                                 | Assistant in Physics                   |
| C. A. Arthur Utt, B. S. (Cornell College)                       | Assistant in Chemistry                 |
| Miss Florence Warner, A. B. (Illinois University)               | Assistant Librarian                    |
| Miss Anna Gordon, A. B. (Iowa College)                          | Assistant in Preparatory Department    |
| Miss Bertha M. Johnston (Simmons College)                       | Assistant in Domestic Science          |
| Harrison E. Porter, B. S. (K. S. A. C.)                         | Assistant in Mathematics               |
| E. L. Sieber, A. B. (Indiana University)                        | Assistant in Chemistry                 |
| C. S. Knight, B. S. Agr. (U. of Wis.)                           | Assistant in Agronomy                  |
| Earle Brintnall, B. S. (Iowa State College)                     | Assistant in Dairy Husbandry           |
| J. B. Parker, M. A. (Ohio State University)                     | Assistant in Entomology                |
| Allen G. Philips, B. S. (K. S. A. C.)                           | Assistant in Poultry                   |
| Miss Gertrude Cannon, Bethany Col. and Oberlin Conservatory     | Assistant in Music                     |
| Miss Bertha Bisby                                               | Assistant in Preparatory Department    |
| Fred M. Hayes, D. V. M. (K. S. A. C.)                           | Assistant in Veterinary Science        |
| L. D. Bushnell, B. S. (Wisconsin)                               | Assistant in Bacteriology              |
| Miss Bertha Donaldson (Chicago University)                      | Assistant in Domestic Art              |
| Miss Elizabeth Putnam (Chicago Art Institute)                   | Assistant in Drawing                   |
| L. E. Petty, A. B. (Wabash College)                             | Assistant in Mathematics               |
| Jules C. Cunningham, B. S. (K. S. A. C.)                        | Assistant in Horticulture              |
| Miss Annie E. Lindsey (Simmons College)                         | Assistant in Domestic Science          |
| H. E. Kirby                                                     | Assistant in Printing                  |
| John E. Smith, B. S. (Oregon Ag. Col.)                          | Assistant in Botany                    |
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| D. Edmond Rudolph                                               | Band Leader                            |
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# THE INDUSTRIALIST

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No. 12

## *Recent Progress in Wheat Breeding.*

About a year ago the present writer gave a synopsis of the development of the experimental work in the breeding of wheat at this Experiment Station, and outlined some of the fundamental principles underlying this work.\* In view of the substantial progress made during the past season, it seems desirable that the present status of the experiments be stated for the benefit of those interested in their outcome. Beginning in 1906 by selecting 537 heads of wheat, which later additions raised to 616, chosen from some 600 variety plots of wheat coming from all parts of the world, and with several hundred additional plants sprung from individual grains selected for a special study of heredity in respect to grain characters, careful records were made in the laboratory for two successive years, whereby we obtained a complete account of the characters, both of the originally planted heads and of the progeny plants in full for the next generation. In view of the enormous increase in material and the expense involved in record making, it became necessary this year to restrict the pedigree record system to certain selected families of wheat plants, 38 in number, out of the original total of 616.

It will, perhaps, be well to explain a little more fully the purpose of the pedigree records. All of the chief characters in a wheat plant that can be conveniently measured or accurately observed are taken for the same families of wheat plants (meaning by "family" any group of plants having a common ancestor in a single individual) and followed through as many successive generations as may be necessary in order to determine what characters in wheat are heritable and the degree to which they are found to be so. Now that this is of fundamental importance is seen at a glance, when we remember that a wheat plant is a whole made up of a great many organs, all of which have definite "characters" in respect to size, shape, color, and a hundred other factors, and each of these characters varies more or less definitely

\*"Wheat Breeding at the Kansas Experiment Station," H. F. Roberts. *Industrialist* Vol. 34, No. 15.

in, say, a thousand plants possessing it. But not only is this the case, but when some character varies, from whatever cause, some other character will invariably vary with it more or less. Now, what we want to find out is exactly *what* characters vary with *what other* characters, and *how much*. This joint variation, a thing that occurs in all living organisms, we call "correlation," and the *howmuchness*, the *measure* of this reciprocal variation or change, we call the "coefficient of correlation," just as the degree of variation of any *one* character taken by itself is measured and expressed by what is called the "coefficient of variability." Now, by means of these records of measurements we can get at such questions as the following: What are the outside limits of yield in various races of wheat plants as determined by the number of bearing stalks, the length of the head, the number of "meshes" or spikelets it will bear, the number of flowers, and the number of such flowers that will set seed? In other words, what are the limits of productivity set by nature to the breeder's efforts in any number of pure varieties or races of these plants under identical conditions of culture? More than this, we are able to discover exactly what relation exists between any tendency toward prolificness and the size and weight of the seed produced. Most important of all, we can determine what relation may exist, what "correlation," between any one or more of these fifty characters that we have measured, and the economic value of the kernel as determined by its protein content. We want to know, for example, if a plant such as our No. 943.6.22.9, bearing as high as 79 grains in a head, which we find, is only a "fluctuating variation," merely the high end of a series, the mean or average of which is down somewhere near the family average of 25 grains, and the high yielding power of which can only be maintained, if at all, by annual selection. Of this nature are so many of the selections made by enthusiastic beginners in plant breeding, and of this nature is much of the so-called "improvement" obtained in the breeding of cereal crops.

On the other hand, what we chiefly want to know is, whether we have turned up at any time that much-sought-for prize of the breeder, a "mutant," or a sport, a plant which has completely jumped the track, as it were, along which the parent variety was traveling and which has marked out for itself a new route. Now, it is very plain that if we have, say, some thousands of plants descended from the same original ancestor, and if, through successive years of measurements, we find the outside limit of yield of a certain wheat family to be 75 grains per head and the average or mean of that family to be 30, and then, if a single plant suddenly

turns up in the family that leaps clear out of these limits, we shall be able to isolate this plant and find out whether *its* progeny, through successive years, maintain the new standard of performance or not. And if they do, then we may be sure that we have a mutant or sport, and that one hundred acres of plants of this sort will out-yield the parent variety in the same proportion. By maintaining such a system of records as has been mentioned we are enabled to discern and to isolate these superior mutants. The fact of the existence of mutants, their sudden appearance in the way indicated and their subsequent behavior, is as well established a fact as any that we have in biological science, since the epoch-making discoveries of the great Dutch botanist, Professor Hugo De Vries.

Of course, no ordinary person or institution could possibly finance the record-making necessary to follow any very large number of pure-bred families of wheat through very many generations, on account of the enormous rate of increase. The wheat breeder, therefore, has to begin by weeding out the unlikely families. This, of course, is a matter involving judgment, and at best is a delicate undertaking; for we may at any later time have occasion to regret the omission of some apparently mediocre family from the records. Nevertheless, we have to proceed more or less on the assumption that "Unto him that hath shall be given," and so we are obliged to maintain on our records from year to year only those chief families the all-round survey of whose performance leads us to believe may possibly harbor the geniuses of the wheat tribe. It will therefore be seen that our record system has a two-fold value—that of laying bare for us, through mathematical analysis, of the family secrets and interior workings of very many pure-bred families, coming from very many distinct varieties, brought hither from all parts of the world, and belonging to all of the most important races of wheat, and that of revealing the existence of superior sports. For a broad grasp of the problems of breeding in wheat, this fundamental knowledge is absolutely indispensable.

Mention has already been made of the fact that by this keeping of accurate and quantitative records of characters for the same families, and through many successive generations, we can also find out with a mathematical precision, proportionate to the number of plants worked with, the exact degree to which any character we choose to select for will turn up in the next generation. The writer cannot too strongly emphasize and drive home the fact that the mathematical tools for determining all of these factors—

variability, correlation and regression or heredity—have long since been made and sharpened in the workshops of great mathematicians, beginning with Quetelet, in Belgium, long ago, and especially through the recent labors of Karl Pearson, professor of applied mathematics and mechanics in University College, London, and his school of co-workers; and by Prof. Chas. B. Davenport, of the Station for Experimental Evolution, which the Carnegie Institution has founded in this country, and where the methods elaborated by these men are being applied in the most brilliant manner toward the solution of many profound problems in biology. Recently, also, in the Illinois Experiment Station, these wonderful biological tools have been set to work upon their long accumulated records of characters in pure-bred races of corn, while here in Kansas we are putting them into operation with wheat.

So much for the way of getting at the facts. Now for the material. It was stated that we began with over 600 heads in the first generation. These, when grouped according to the principal races to which they belonged, will themselves yield fair information regarding the coefficient of variation for the characters measured as applied to whole races of wheat. But in the progeny of these heads, for which we have complete records for all the plants, we have, in the second generation alone, the enormous mass of about 40,000 complete records covering about fifty different and distinct characters in the whole of this vast number of pure-bred plants. When worked through, this material will yield absolutely reliable data, not only for the behavior of races, but for whole groups of individual families of wheat.

Now, in the 38 selected families chosen to undergo the complete series of measurements and to enter the complete pedigree records of the next (the third) generation, and which were harvested this past summer, we have 822 plants with 12,460 heads. This additional material, with the preceding, will furnish all that can possibly be desired for the solution of most of the scientific problems in heredity and variation in wheat, so far at least as two complete generations are concerned. The mathematical reduction of all of these records now lies full before us.

It should be clearly and distinctly understood that this is absolutely the first time in all the long and desultory history of "wheat breeding," so-called, that there has ever existed *anywhere* such a volume of data for the solution of the fundamental principles *underlying* and *determining* the breeding of this particular plant; and it is a further fact that data of such amplitude have seldom been

available to the use of the plant breeder at any time. Such an array of data as we possess in regard to wheat is far greater in its mass and far ampler in its scope than any single investigator can usually ever command, and its accumulation has been made possible only through the fortunate establishment of the Adams Fund by Congress.

What we are therefore first undertaking is the herculean task of the mathematical reduction and analysis of these records. We need immediate help for the completion of this great work. The records are here, intact, for fifty wheat characters, through three generations in many and through two generations in all of the plants. The writer knows of no experiment station which possesses anything comparable in the field of plant breeding.

But unless the constantly augmented work of instruction in the Department of Botany, brought about by the tremendous growth of the College and by the addition of the new courses, be more fully provided for, unless the addition of sufficient assistance enables those charged with the actual work of plant breeding in the department to push it through to an immediate and definite conclusion, then these records and the vast amount of experimental work contemplated to determine the hardness and specific gravity of the wheat of these hundreds of pure-bred races will have to remain untouched. The records will have to hold their invaluable information in the vault where they now lie on file, and the great problem that we had determined upon solving this winter, viz., the correlation between hardness of grain, which we determine with our own apparatus, and the protein content as ascertained by chemical analyses, must remain unsolved.

The breeding and improvement of wheat is too overwhelming in its importance to the State that raises half of the grain of the hard red winter wheat district, nearly one-fifth of all of the hard red winter wheat of the country, and a full tenth of absolutely all of the wheat, hard and soft, winter and spring, of the whole United States, to permit of one moment's slackening of our efforts to drive this work through to an immediate and successful issue. The duties of instruction must go on; the youth of the State must be taught; but surely this commonwealth can afford both teachers for the College and investigators for the Station, where the utility of the investigation of a given problem so vital to the State's welfare is evident, and where the foundations have been so carefully and thoroughly made.

Coming back to our wheat families, the inquiry might be raised as to what has become of all of the rest of the pedigree families of

the original 616, aside from the 38 selected for carrying on the pedigree records into the third generation. Of these remaining 562, the pedigree records are continued, but for the grain characters alone. Through the elimination of the unfit by winter-killing and other causes, this original number was reduced to 482 families in 1907, of which 450 were planted in the fall of that year. Of these, 352 families had produced enough grain from the single head-rows grown the previous season to admit of their being planted in rows 66 feet (one chain) long of each, with 250 grains to the row, the seeds being planted about one and one-half inches apart. These rows of pure-bred wheats were planted alternately with and at distances of 12 inches from rows of like length and containing a like number of seeds of a standard hard red variety, known as Kharkov, obtained from the Department of Agronomy, where it has been grown for several years, and has given highly satisfactory yields. While this Kharkov variety is not "pure-bred," it is nevertheless an unusually pure race of uniform type. It was therefore selected to use as a check or standard variety for comparison of the yields of the pedigree rows in the absence of a sufficient quantity of any of the pedigree wheats themselves to use for the purpose. In future years we shall continue such tests with the highest yielding pedigree wheat as the standard for comparison.

These alternating rows of pedigree and Kharkov wheats furnished, as is seen, a row of the check or standard on either side of and but 12 inches from every pedigree wheat row. It was stated that 352 pedigree families were planted in these 66-foot rows. The remaining 98 families, having a smaller available quantity of seeds, were planted in the same manner, but in rows of shorter length. At harvest time, each row of pedigree and each row of Kharkov wheat was carefully cut, separately sacked, subsequently threshed by hand and the grain weighed. From this weighing test some exceedingly interesting results appear, which are useful and instructive, despite the fact that a single row of a given pedigree wheat may not necessarily stand, and of course is not taken as a positive index to the performance of its progeny on an 80-acre field. So far as the results go, they are valuable at least by way of comparison.

The total number of Kharkov rows 66 feet long, with 250 seeds each and alternating with the pedigree rows, was 367, slightly more than the total number of the latter, owing to duplication of some of the pedigree rows, making 360 in all of these, and because of extra rows of Kharkov at the ends of the planting blocks.

It is found that the total average yield in the Kharkov wheat in these 367 rows was 409.2 grams (14.2 oz.), or seven-eighths of a pound to the row of 250 plants. Now, it so happened that we had growing at the same time a comparative yield test of 41 promising wheat varieties (not pure bred), selected and saved out of something like 1000 plots of such varieties grown during the preceding year, and intended to serve as stock for future pedigree selection. These varieties were planted in ten-row lots, also alternating with the Kharkov, and in 66-foot rows with 250 grains per row. The average weight of grain from 759 of these Kharkov rows was 480.3 grams (16.8 oz.). Assuming that the average of 480 grams per row represents the true Kharkov average, rather than the 409.2 grams, which was the average of the rows alternating with the pedigree wheats, and thus giving the Kharkov a liberal handicap, we still find, on summing up the yield records for the pure-bred wheats, that while there were 50 of the pedigree wheats that exceeded the yield of either one or the other of the Kharkov rows alongside, and 47 others that exceeded both of them in yield, there were still 38 more, or 10 per cent of the total number of pedigree wheats in 250-grain rows, that exceeded the total Kharkov yield of 480 grams, which stands as the average for 759, 250-grain rows of the same length.

Without going into further details, this will sufficiently show the method pursued in getting the preliminary test of yield of our pedigree wheats. This fall we planted, in ten-row plots with rows 66 feet long containing 250 grains per row, all of the pedigree wheats that equalled or exceeded either one of the adjoining Kharkov rows in yield, together with some others of special interest. Each of these ten-row plots stands beside a corresponding ten-row plot of Kharkov again, planted in the same way. Next fall, the winners in the second yield contest will go into fractional acre plots. Assuming the rate of increase of the grain to be as low as 400 grams per row next summer, we should still get  $8\frac{3}{4}$  pounds, or five quarts, of wheat from each of the ten-row lots; and if the yield of some of them corresponds in the least with their this year's performance they may give us as much as one-third of a bushel of pure-bred seed. By another year, sowing the five quarts each, which we have supposed the pedigree varieties to yield at the lowest estimate, we should have, assuming the crop to be produced at as low a rate as the State's average of 14 bushels per acre, a yield of about one-half bushel of pure-bred seed from each of our varieties in 1910. On the other hand, from the best of them, assuming a yield of 800 grams per row to be borne out this coming season, we would have ten quarts of seed from such vari-

ties, and with a yield at the rate of 25 bushels per acre we would have some 6 bushels of pure-bred seed from each of the best yielding varieties, enough to plant 5 acres, and this at the end of three years of crops from a single head planted in 1906.

Let us hope that next September may witness the sowing of the first one-fifth-acre plots, and the fall of 1910 the sowing of the first 5-acre fields of pure-bred wheat ever grown in Kansas. But our labor is never done. Every year we add hundreds of additional new pedigree selections, every year we import more and more new varieties for testing out under our climatic conditions, and from which we may continually derive new pedigree strains from year to year. Annually the work of measuring, record making and yield testing of pedigree plants goes on as before. Next year, moreover, we are about to initiate a new phase of work with respect to the hybridization of wheat. It was stated in the writer's previous article that a great many plant hybrids had been secured in the past, and which we still are growing. These, however, were obtained by the crossing of plants from mass variety lots, and not from pure-bred plants, the stability of which had been determined by successive years of pedigree records. We now have such plants with three years of records behind them, and concerning which we have definite knowledge as to the relative yield-rate of their families, a most important factor for the practical breeder to take into consideration in undertaking the hybridization of wheat. Moreover, we are now in possession of a considerable list of wheat characters which, as we say, "Mendelize"—that is to say, where two given characters are united in a cross there is a splitting-off in each successive generation of the hybrid offspring, 25 per cent of the progeny carrying one of the characters, known as a pure "dominant," and another 25 per cent carrying the other character, known as a pure "recessive."

Where two characters Mendelize, it is useless to expect to combine them permanently, because by this perpetual splitting-off in each generation the characters ultimately become entirely separated in the progeny and the hybrid combination is reduced to a practical zero. We can, however, combine more than one pair of characters at the same time in crossing, and endeavor in this way to secure, if possible, off-spring in which the splitting may leave a desirable recessive of one character, lodged in the same plant with a pure dominant of another. These characters would never afterwards become separated, but would forever appear permanently combined in all of the offspring. Without going into further details it can be seen by anyone that the modern production of wheat

hybrids is for a large number of characters as definitely a mathematical matter as the multiplication table.

But there are still other problems than those that have been given. There is the problem of rust resistance and of drought resistance, which we have scarcely touched, and not at all in a quantitative way. One problem, however, we have been able to deal with definitely, and that is the question of the "yellow berry," the appearance of soft or starchy grains in hard red winter wheat, and which occurs in the case of pure-bred as well as of the ordinary varieties. The results and conclusions thus far obtained in respect to this matter are set forth at length in a bulletin which has just appeared from the Experiment Station, and if the data therein mean anything we may consider ourselves in a fair way to obtain a pure-bred wheat free from "yellow berry."

But the writer must say to the people of the State of Kansas that our needs for the conduction of this work in plant breeding are very great. In the first place we need permanent land. We are now operating on short-time leases, under which we pay a high rental. We need a tract of about 20 acres, owned by the College and devoted exclusively to the breeding work of this department; for, in addition to wheat, we are also breeding pure races of alfalfa, of which we already have thousands of plants. We need money with which to buy needed apparatus for the laboratory in plant breeding, and meteorological apparatus to put into the field, in order that every day in the year we may record soil temperatures, air temperature, humidity, and all the other climatic factors affecting the growth of the plants, so that we may be able to correlate accurately the changes in time and rate of vegetative growth, time and rate of maturation, changes in the relative starch and gluten content of the kernel, with the seasonal factors that so profoundly affect the wheat plant. This is a new line of investigation which has thus far never been carried out with respect to wheat. We need means to enable us to plant many more pedigree plots than we can do at present; to enable us to employ more help in harvesting, more help in making the laboratory measurements and records. We need enough assistance in the department so that the routine of elementary class teaching in Botany I and II (now sub-freshman work) would not be permitted to clog and hamper the development of the work of investigation that has been successfully launched, which it effectually does at present.

The methods of experiment are plain and clear. The first results of this work are now appearing. Shall it be allowed to go on

by halves and quarters, or will this State take hold of the breeding of wheat and alfalfa with both hands and drive it through to the successful issue that awaits it? The answer lies with the legislature now about to assemble.

And let it be clearly and distinctly understood, that in speaking thus plainly to the people in behalf of this important work all personality is totally eliminated from the matter. While it is perfectly true and is conceded that the Department of Botany in the Experiment Station has created the present status of wheat and alfalfa breeding at this Station, and is responsible for and to be credited with the results as they stand, it is nevertheless true that no such work "belongs" in any narrow proprietary sense to one department or another, but rather to the Station as a whole, in trust for the whole people of the commonwealth.

Other departments must enter and share largely in this work in the future. The Department of Chemistry, for example, must needs make the analyses for protein, carbohydrates and ash of the grain of these pure-bred wheats, and should no doubt conduct the subsequent milling and baking tests, since it already has apparatus installed for this purpose. But the experiments at their present stage are wholly of a biological nature, and until the preliminary stages are over, and the pure-bred varieties we are obtaining by means of the methods and apparatus originated here, it is necessarily true that the immediate call for help and aid in the work of plant breeding should come from the Botanical Department, and the present need is urgent and imperative.

H. F. ROBERTS.

A count of students made by the Secretary on January 14 shows the following enrolment for the winter term.

Preparatory .....	105
Sub-freshmen .....	391
Freshmen .....	419
Sophomores .....	370
Juniors .....	234
Seniors .....	134
Graduates .....	9
Specials .....	24
Domestic science short course .....	78
Dairy short course .....	14
Farmers' short course .....	197
 Total .....	 1975

These figures represent the students who have completed their assignments and have paid their fee for the winter term. A number of graduate and special students have not yet paid their fee, so that we are safe in saying that we have already an attendance of fully two thousand.

**Local Notes.**

The *Topeka Capital* publishes a very fair half-tone of Dr. J. D. Walters.

Superintendent McClelland, of the Hays Branch Experiment Station, is the proud father of a brand-new baby girl.

The next basket-ball game will be played Thursday, January 21, at the Y. M. C. A. gymnasium. The Haskell Indians will be the victims.

The Duroc-Jersey Breeders' Association will hold a combination bred-sow sale at the College on March 5. The proceeds of the sale will be used for prizes at the first State Fair held in Kansas.

President Nichols attended the meetings of the Kansas Academy of Science, the State Horticultural Society and the State Teachers' Association at Topeka during the holidays and took an active part in the State Farmers' Institute at the College when at home.

The College basket-ball team played a spirited game with the Iowa State College five at the Y. M. C. A. gymnasium, Tuesday evening, and beat them by a score of 42 to 32. This was the first athletic contest we ever had with Ames and is a good omen for those to come.

The senior class in mechanical engineering presented Professor Potter with a handsome oak rocking-chair as a Christmas gift for his son James, who is now a year and a half old. This is the second time that the class has honored the professor with a rocker as a sign of their esteem.

Mr. Laurence Brink, son of Doctor Brink, has been appointed to a position in the English department of the Michigan Agricultural College. Mr. Brink was a member of the senior class here in 1903-'04. He graduated from the classical course of the University of Rochester in 1906, and has since been teaching with much success in the high school at Marquette, Mich.

Following is a list of dates of the College lecture course: Edward Amherst Ott, January 26; Ralph Bingham, February 11; Frank Dixon, February 15; Frederick Warde, March; Schildkret's Hungarian Orchestra, March 12; Chicago Glee Club (complimentary). In addition to these numbers there will be a complimentary number, and a lecture by Gov. J. A. Johnson, but we understand that his date has not been positively placed as yet.

At the State meetings at the College Prof. H. F. Roberts presented a paper in which he gave some of the results of his labors in breeding wheat. The professor showed that he had bred wheat of better quality than any ever imported and that this pure-bred wheat yielded greatly increased returns. He takes the eminently sound position that the Experiment Station can breed wheat suited to the conditions of Kansas better than any that can be imported and at less cost. This is a matter that may well claim the attention of the legislature in making appropriations.

Under the very capable supervision of Mrs. Mary (Pierce) VanZile, who is an alumnus of the College and its dean of women, a highly instructive program was prepared for the women and girls who attended the State Farmers' Institute at the College. This included lessons in cookery and in sewing in the splendid new home of the Domestic Science and Art Department, with lectures by Mrs. VanZile and Miss Ula Dow, assistant in domestic economy, and Miss Antonetta Becker, superintendent of domestic art. The subject matter of the addresses and demonstrations covered a wide range in the economy of the home.—*Kansas Farmer.*

Prof. R. J. Kinzer and Asst. Prof. G. C. Wheeler, of the Department of Animal Husbandry, afforded the assembled farmers and their sons of the State institute an opportunity to secure accurate knowledge in stock judging such as few of them had ever hoped to secure. The herds of pure-bred animals belonging to this department were used, as were some of the Herefords consigned to the public sale. Among the animals shown by the College were the prize-winning steers which won at both the American Royal and the International Live Stock Exposition last fall. These afforded the amateur judges a rare opportunity to see really high-class cattle and at the same time to observe the results of the perfect methods of fitting employed in Professor Kinzer's department. Percheron horses, Shorthorn, Hereford, Aberdeen Angus, and Galloway cattle, besides several breeds of sheep and swine, were used as object lessons by the students trained in the use of the score-card.—*Kansas Farmer.*

The following item from the Ottawa *Herald* of January 9 refers to the golden wedding of one of the "early makers of the Kansas State Agricultural College." Doctor Ward was professor of mathematics here from 1873 to '83 and Acting President of the College in 1879 and '80. Mrs. Ward was instructor in French and German in 1875 and '76. With the friends and neighbors of the worthy couple at Ottawa we wish them many more years of health and happiness. The *Herald* says: "While but relatively a small proportion of Ottawa was or could be present at the reception given by Dr. and Mrs. M. L. Ward on the occasion of their golden wedding anniversary yesterday, all of Ottawa was there in interest, and the felicitations which those present spoke were part of the sentiment which the whole community must share. To none of its present residents and to none who have passed on does Ottawa owe more than to Doctor and Mrs. Ward, and to few does she owe as much. The half-century whose attainment was celebrated yesterday has largely been spent in Ottawa, and the influence of those years has been built in a large way into the attainments of the town and the State along educational and moral and social lines. A bare return for the good gifts received at these hands through all the years would constitute a very friendly interest from Ottawa in the affairs of Doctor and Mrs. Ward in their advancing age, but Ottawa is glad to acknowledge the promptings of sincere love, as well as of fairness, in her attitude toward these

most excellent old people. The guarantee of continued comfort and happiness which lives such as theirs must contribute to such a golden wedding day will have whatever additional force the esteem and consideration of Ottawa can give."

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### *Alumni and Former Students.*

W. P. Tucker, '92, and Stella (Kimball) Tucker, '94, are visiting with Professor and Mrs. Dickens, '93 and '90. Mrs. Tucker is slowly recovering from a prolonged illness.

Changes of address: W. O. Peterson, '97, Vermillion, Kan.; F. E. Balmer, '05, K. S. A. C.; Odessa Dow, '06, Ogden, Kan.; C. G. Elling, '04, Central Constancia, Cienfuegos, Cuba.

R. S. Kellogg, '96, in the Forest Service, United States Department of Agriculture, visited the College this week. He was called home by reason of the serious illness of his mother.

Friends of Miss Mamie Hassebroek ['04] will be interested to know that she has recently located in Woodward, Wis., where she is teaching domestic science and branches in high school.—*Republic.*

Farmers' bulletin No. 339, entitled "Alfalfa" and issued by the Department of Agriculture, has been prepared by J. M. Westgate, '97, assistant agrostologist. It is a pamphlet of 48 pages which treats in a very satisfactory way the various questions relating to alfalfa, with especial reference to the needs of portions of the United States where the plant is not generally cultivated.

Mrs. Nellie (Sawyer) Kedzie-Jones, '76, for fifteen years at the head of the Domestic Science Department of this institution, visited in town three days this week. She has been absent from her home in Kalamazoo, Mich., for three or four weeks and within that time has lectured in Omaha at the Corn Exposition, and before the State Teachers' Association of Colorado in Denver, and has under the auspices of the Women's Clubs of Victor, Colo., given a week's lectures and demonstrations at that place. She stopped here on her way to Topeka, where she read a paper before the State Board of Agriculture on "The Great Granddaughters of Kansas Pioneers." Her stay in Manhattan was an almost continuous round of receptions, dinners, luncheons, etc., and scores of her old friends were happy in the opportunity to meet her again. She addressed the students Tuesday morning and the girls of the institution Wednesday afternoon. During her visit she was the guest of Lydia (Gardiner) Willard, senior student in 1884. Mrs. Jones was very strongly impressed with the numerous changes in the town and the great advance that the institution has accomplished within the seven years that have elapsed since she had been here.

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(Board of Instruction concluded on last page.)

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## *The Lincoln Centennial.*

During the present winter the American people will celebrate in many ways and in divers places the centennial of the birth of our great war president. Of all our presidents he was preëminently a man of the people. It seems fitting, then, that in an institution like ours, founded for the practical training of the industrial classes from which he sprung, founded, too, under an act of Congress passed during his administration and signed by his own hand, some especial attention should be given to the life and preëminent services of this typical American.

In so brief an article as this must be there can be no attempt to give the details of Lincoln's life, much less to discuss with any fullness his policies or his character. In this sketch it is desired rather to call attention to a few of the more significant features and acts of his remarkable career and character.

The ancestors of Abraham Lincoln, as far as they have been with certainty traced, belonged to "the poor white trash" of the South. His father, Thomas Lincoln, a shiftless, poverty-stricken, obscure individual who pretended to be a carpenter, but who never seemed to work much at the trade, or at anything else for that matter, was born in Virginia. His mother was likewise a Virginian and came, if possible, from a poorer and less promising stock than her husband. They did not remain in Virginia, however, but migrated to Kentucky, where on the 12th day February, 1809, their second son, Abraham, was born. From Kentucky, the ne'er-do-well Thomas removed to Indiana, where for several years he maintained for himself and family a wretched and almost worthless existence, enjoying less than the comforts that ought to belong to one's horses and pigs.

As Abraham approached manhood, his father again took the notion to seek a new home; so, abandoning the wretched cabin in the Hoosier state that had been dignified with that hallowed name, he took his few belongings in a wagon drawn by an ox team and finally reached the Sangamon river in Illinois, where he began

again the arduous task of clearing a dwelling-place in the wilderness; or, rather, Abraham began that task and cleared ten or fifteen acres before he reached his majority. Surely this awkward and grotesque youth was not favored by circumstances, and the graces did not smile very sweetly upon his early years. He was trained to bear burdens even from his birth.

It is not necessary to follow the early career of Abraham Lincoln. For more than a generation the searchlight of history has been shining with unwavering intensity upon every discoverable detail of that life.

Lincoln was not an educated man in the sense of being a partaker of the exact and systematic culture of the schools. And yet in a large and perhaps a truer sense he became well educated—better than many who have had the advantage of such training. Many a youth “goes through college” whose only evidence of scholarship is in the diploma that hangs conspicuously upon his office walls. Not so with Lincoln. He had the spirit of a scholar and a thinker. From his youth he was accustomed to read every book that came in his way. As he had a prodigious memory, he gained, as a result of such reading, a by no means small amount of the best of the world’s literature. Milton, Shakespeare, John Bunyan, the English Bible—such books as these he knew, and he that knows these, even any one of them, cannot properly be called uneducated. How many college graduates have a better preparation for life or a better training for effective speech?

Lincoln did not prove to be a good business man, and failed two or three times in the attempt to make a living by keeping a country store. The Almighty had higher service for him and would not let him be drawn aside to the work of mere money-making. His powers were not for himself, but for his country and mankind. If he had no talent for business, he had a positive genius for politics and for making friends, and we find him as early as 1832, when he was only 23 years old, a candidate for the state legislature, with popularity enough to secure the support of the voters of his town. He was not elected, however, so he devoted himself to the study of law and of surveying, the former that he might prepare himself for a life work, the latter that he might make a decent living. In the following election (1834) he succeeded in being chosen to the legislature, and for several years thereafter occupied a seat in that body.

Even then, a quarter of a century before he became President, the slavery question had become a matter of vital interest to the young statesman, and he was formulating his convictions on the subject.

In either 1834 or '35 he introduced a resolution before the legislature declaring "that the institution of slavery was both injustice and bad policy; that Congress had no power to interfere with slavery; that it had power in the District of Columbia, but should not exercise it unless at the request of the people of the District." This has been interpreted by some as a declaration of the doctrine of state sovereignty, so far as its statement of the powers of Congress was concerned. A better interpretation is, that he had in view the question of the right of Congress to meddle with slavery where it existed rather than the question of determining whether it should be admitted into new states. The resolution was significant only as showing that he was already forming both constitutional and moral views on this troublesome question, and that his moral and his constitutional opinions did not always harmonize.

At the age of twenty-eight Lincoln had learned enough law to secure admission to the bar and went to Springfield to begin practice. He never became what might be called a great lawyer, although he did become a fairly good one and reasonably successful. He was too desirous of always being on the right side to become famous in his profession, and had too little liking for drudgery to become learned in it. Politics was his natural sphere, however, and he soon came to be known as one of the leaders of the whig party in his part of the state. In 1846 he secured an election to Congress from his district and occupied a seat in the popular house of the national legislature for the next two years. But he made no especial mark in that position, and it was not until several years later that his political career may be said really to have begun. After the compromise of 1850, which was, in effect, the repeal of the Missouri Compromise, all the territories were opened for the admission of slavery, if the people of those territories so decided, and a more stringent fugitive slave law than had ever before existed was put in operation. A little later, in 1854, the Kansas-Nebraska Bill was introduced into Congress, and that tremendous conflict over the admission of Kansas was begun—a conflict attended by scenes of bloodshed and border ruffianism accompanied by John Brown's Pottawatomie massacre on the plains of "bleeding Kansas," and characterized by the most exciting debates in Congress and by the brutal assault on Charles Sumner, while seated at his desk in the senate chamber, because of remarks he had made in his now famous speech, "The Crime Against Kansas."

These events stirred the whole nation to the depths, and slavery

became the absorbing question, north and south. In the meanwhile the whig party had gone to pieces, and out of its ruins, together with the remnants of free-soil democrats and other anti-slavery organizations, had been organized the republican party—a party not then advocating the abolition of slavery, but generally opposed to its extention into territories where it did not already exist. Lincoln found himself naturally in alliance with this party.

To add to the excitement came the decision of the supreme court in the famous Dred Scott case. Dred Scott was a slave in Missouri. His master had taken him into free states, where he had married, had children, and lived for several years. Then he had been taken back to Missouri. Having been whipped for some offence he brought suit for damages, claiming that by virtue of his residence in Illinois he had become a free man. The case was carried by appeals from one tribunal to another until finally it reached the supreme court of the nation. The decision was rendered by Chief Justice Taney, sustained by two-thirds of the bench. It declared that negro slaves "had no rights or privileges but such as those who held the power and the government might choose to grant them;" that Dred Scott, therefore, was no citizen, but a thing; that his residence in a free state did not make him free, and that any law prohibiting a slave owner from carrying his slaves into any state or territory was unconstitutional and void, since a man had as great a right to carry slaves into any state as he had to carry other chattels.

This decision startled the North like the trumpet blast of an enemy at night. It meant that legally all the states were open to slave occupation, wherever a slave owner might choose to reside with his black "chattels." Thenceforth there could be no compromise; events moved forward as inexorably as destiny toward the only solution of the slavery question that was now possible—the solution by force. The "irrepressible conflict" was fast approaching. Indeed, in a true sense it had already begun. Lincoln did not hesitate as to the side on which he should take his stand. A brother lawyer said to him: "Lincoln, the time is coming when we shall be either abolitionists or democrats." He replied: "When that time comes my mind is made up, for I believe the slavery question can never be successfully compromised."

It was while the country was excited over the Kansas controversy and the Dred Scott decision that the famous series of debates occurred between Lincoln and Stephen A. Douglas, senator from Illinois. Slavery, almost of necessity, formed the chief

topic of discussion in those debates. Douglas was then admitted to be the ablest debater and the greatest political orator in the land, and by many of Lincoln's friends it was thought to be not only a hazardous but even a foolhardy undertaking for him to throw down the gauntlet to such a doughty antagonist. But Lincoln knew his ground and could see farther than any of his friends. He knew better than they what was at stake. He discussed the questions in such a way as to attract the attention of the whole country and to set forth for all time the principles on which the slavery question rested and the way in which it would have to be considered. "A house," he said, "divided against itself cannot stand. I believe this government cannot endure half slave and half free. Either the opponents of slavery will avert the further spread of it and place it where the public mind will rest in the belief that it is in the course of ultimate extinction, or its advocates will push it forward till it shall become alike lawful in all the states, old as well as new, North as well as South." He, of course, opposed slavery, yet he did not in the heat of controversy go beyond the constitutional limit. He admitted the right of any state, when emerging from the territorial condition, to decide for itself whether it would have slaves, and he recognized, also, the fact that the Congress had no right to interfere with slavery in the states where it already existed. He was an anti-slavery man, but he was not an abolitionist.

This series of debates, in which Lincoln showed himself to be fully a match for his redoubtable antagonist, attracted so much attention that he was soon invited to deliver an address in New York. In this address, the famous Cooper Institute speech, he took the same ground, and spoke so wisely and so well that the attention of many eastern men was drawn to him as a suitable candidate for the presidency in the approaching struggle. Two years later he was again pitted against Douglas, and this time he was successful, the first republican to fill the presidential chair. Before he took the oath of office South Carolina and other southern states had passed ordinances of secession, the confederate government had been largely organized, and the nightmare of civil war was brooding over the land. No greater task was ever given to man than that which Lincoln had to bear. To his unaccustomed hand was assigned the supreme duty of holding the helm during the wildest storm and through the blackest night that ever nation experienced and survived.

We often hear it assumed that the civil war was fought for the destruction of slavery. Not so. It was waged, rather, for the

preservation of the union. Abolition was only an incident of that struggle. Lincoln himself did not, in the beginning, intend nor did he think he had a right to interfere with the institution of slavery where it was already established. In his inaugural address he said: "Apprehension seems to exist among the people of the Southern States that by the accession of the republican administration their property and their peace and personal security are to be endangered. There has never been any reasonable cause for such apprehension. Indeed, the most ample evidence to the contrary has all the while existed and been open to their inspection. It is found in nearly all the published speeches of him who now addresses you. I do but quote from one of those speeches where I declared that 'I have no purpose, directly or indirectly, to interfere with the institution of slavery in the states where it exists. I believe I have no lawful right to do so, and I have no inclination to do so.'" But while he declared that he had no intention to interfere with slavery, he also declared that it was his intention to defend the union. "I shall take care," he said, "as the constitution expressly enjoins upon me, that the laws of the union be faithfully executed in all the states." To his "dissatisfied fellow countrymen" he said: "You have no oath registered in Heaven to destroy the government, while I shall have the most solemn one to 'preserve, protect and defend' it." It was for this purpose that the war was fought. The secessionists sought to destroy the union; Lincoln and the soldiers of the North sought to "preserve, protect and defend" it.

This, also, was the fundamental purpose of the emancipation proclamation. That immortal document was issued not, primarily, for the destruction of slavery, but as a war measure for the preservation of the union. In proclaiming liberty to the blacks the President, after more than two years of war, expressed himself as ready to violate the constitution in one particular in order that it might not be all overthrown. He issued the proclamation, as he said, "By virtue of the power in me vested as commander-in-chief of the army and navy of the United States in time of actual armed rebellion against the authority and government of the United States, and as a fit and necessary war measure for suppressing such rebellion." The slaves to-day are free and their emancipation constitutes the most distinguishing act of Lincoln's administration, but they are free not so much for their own sakes as for the sake of the nation; they are free that we may have "liberty and union, now and forever, one and inseparable;" they

are free that "a government of the people, by the people and for the people may not perish from the earth."

This was the crowning act of Lincoln's administration. Nothing thenceforth could enhance his fame. It was well, perhaps, that he was struck down by the hand of the assassin just as he saw victory perching upon the union banners. The very tragedy with which his great life ended gave a pathos to his career that nothing else could have imparted. Thenceforth in the thought and imagination of mankind he was sure of a place among the immortals.

No critique of Lincoln as a writer and speaker can here be attempted. Yet it may be fitting to speak a word about his English style. It is hardly too much to say that for certain high qualities of prose expression no American writer has surpassed if, indeed, any has rivalled him. Among these qualities may be mentioned, especially, a homely simplicity and straightforwardness that goes directly to the thought and feeling. There can be no mistaking his meaning, and there can be no doubt in any mind that behind and in the language is a genuineness of conviction and a depth of feeling that show the language to be the expression not only of the head but of the heart. His vocabulary is largely Anglo-Saxon; his words are those of the common people and of every-day life. This is one secret, not only of his simplicity but of that rugged strength so characteristic of his speech. His sentences have also a rare musical quality. Many passages in his speeches have a harmony that affect one like the swelling harmonies of a great organ under the hand of a master. He often used antithesis, thus promoting both the picturesqueness and the emphasis of his language. All these qualities are exemplified in the famous Gettysburg speech. This speech is brief; it required only about two minutes to pronounce it, yet it is without a flaw as a gem of oratorical discourse. It would not be a bad addition to our educational system were every boy and girl in our public schools required to commit it to memory and study it in minutest detail both for the nobility of its thought and the beauty of its language—a perfect type of prose discourse.

The qualities of Lincoln's style to which I have alluded, find, also, splendid exemplification in the concluding words of his first inaugural address. His words sound like the solemn admonitions of one of the old prophets: "I am loth to close. We are not enemies, but friends. We must not be enemies. Though passion may have strained it must not break our bonds of affection. The mystic cords of memory, stretching from every battle-field and

patriot grave to every living heart and hearthstone all over this broad land, will yet swell the chorus of the union when again touched, as they surely will be, by the better angels of our nature."

Where did this man get his marvelous style—the plain and homely vocabulary, the translucent simplicity, the rugged energy, the soul-stirring music of his speech?

These results were partly due, no doubt, to his early reading. I have already referred to the fact that his mind was saturated with Shakespeare and Milton and Bunyan and the English Bible. With these masters of speech as his models, furnishing the very pabulum of his early thought and life, it is not surprising that when he wrote he should write as did they. The influence of biblical thought and imagery upon his style is especially noticeable. Read, for illustration, the second inaugural. In one place he says: "The Almighty has his own purposes. Woe unto the world because of offenses, for it must needs be that offenses come, but woe to that man by whom the offence cometh." And again: "If God wills that the war continue until all the wealth piled by the bondsman's two hundred and fifty years of unrequited toil shall be sunk, and until every drop of blood drawn with the lash shall be paid by another drawn by the sword, as was said three thousand years ago, so still it must be said that the judgments of the Lord are true and righteous altogether."

But more even than to books Lincoln owed his great style to himself. He was one of the common people and he spake the language of the common people. But it was that language ennobled, exalted, refined, purified, glorified, because it had been passed through the alembic of a great soul upon whom had been laid a mighty and inspiring responsibility. He had a great style because he was a great man, living at a great crisis, speaking on great themes.

Lincoln was the incarnation of all that was best in American life. He was, indeed, the typical American. This, more than any other one fact, made him a wise and great President. It kept his hand upon the pulse of public opinion so that he could feel the mighty heart-throbs of the common people, the great tides of popular sentiment that ebbed and flowed in the national mind. Better than any other public man of his day, therefore, he could "read the signs of the times." Consequently, in the crises of the cause for whose prosperity he was responsible, he knew when to act and how to act so as to have behind him the resistless force of

popular support. Well might Lowell sing of him in "The Commemoration Ode:"

"Here was a type of the true elder race,  
And one of Plutarch's men talked with us face to face."

Lincoln is fittingly called "The Savior of his Country," and as he lay cold in death the whole country, North as well as South, might properly have said, as it was said of the Savior of mankind: "He was wounded for our transgressions, he was bruised for our iniquities." Yet in the highest sense he is not truly dead. He is become one of the immortals. To-day, a hundred years after he was born, he is a living force in the nation; and we may well believe that for centuries to come, so long as the union for which he gave his life shall endure, shall his memory be green—a potent factor for all that is best in the American civilization of the future. It will be fitting for coming generations, as the centuries pass, to commemorate the centennials of his birth, and for all the states whose union he cemented with his blood to join with every lover of human freedom in chorusing to his memory: "His body is buried in peace but his name liveth evermore."

"Our children shall behold his fame,  
The kindly-earnest, brave, far-seeing man,  
Sagacious, patient, dreading praise, not blame,  
New birth of our new soil, the first American."

CLARK M. BRINK.

### *Printers' School.*

The following letter to the *Topeka Daily Journal*, by Ewing Herbert of the *Brown County World*, of Hiawatha, is interesting just now when certain parties are trying hard to abolish the Mechanical Departments of the College. We can report, however, that such a course as Mr. Herbert wishes has already been organized and is in successful operation:

"I want to suggest to the legislature through the *State Journal* that a technical school in printing and kindred arts be established at the State agricultural school, where the present excellent printing plant could be used as a starting point. Printers and operators of type-setting machines who are competent are in demand. The large offices have little time to give apprentices—they want to employ finished workmen. The country offices also have difficulty in securing apprentices, and the better men soon go to the city. A school that teaches printing, binding and all its branches would be of great value to the State and our country at large. Printing and binding is easy, pleasant work for men and women who have a taste for anything of the sort. There is a

technical school in Minnesota that turns out masters of the trade — men and women. The students at Manhattan could be paid enough to support them in part by working and learning in the Printing Department. Some of the school books which the State should print could be printed there under direction of skilled men. All the blanks now sold by private firms could be printed by this school and furnished each county at somewhere near cost. All the blank books and election blanks and supplies could be printed there. Any work that the State printing-office could pass to the students with economy would be of value to those working and learning there. The State of Kansas should print all the supplies she uses in State and county, in school and office, at either the State printing-office or at the technical printing school at Manhattan. Let's do something for the boys and girls along this line. The school of journalism is at Lawrence. A great technical school of printing should be established at Manhattan, or at Topeka as an adjunct of the State school system."

WE HAVE been fond, as a nation, of speaking of the dignity of labor, meaning thereby manual labor. Personally, I don't think that we begin to understand what a high place manual labor should take; and it never can take this high place unless it offers scope for the best type of man. We have tended to regard education as a matter of the head only, and the result is that a great many of our people, themselves the sons of men who have worked with their hands, seem to think that they will rise in the world if they get into a position where they do no hard manual work whatever; where their hands will grow soft and their working clothes will be kept clean. Such a conception is both false and mischievous. There are, of course, kinds of work where the work must be purely mental, and there are other kinds of labor where, under existing conditions, very little demand indeed is made upon the mind, though I am glad to say that I think that the proportion of men engaged in this kind of work is diminishing. But in any healthy community, in any community with the great solid qualities which alone make a really great nation, the bulk of people should do work which makes demand upon both the body and the mind. Progress cannot permanently consist in the abandonment of physical labor, but in the development of physical labor so that it shall represent more and more the work of the trained mind in the trained body.

[President Roosevelt, before the Michigan Agricultural College.]

***Local Notes.***

Over two thousand students here this term.

President Nichols went to Topeka Thursday morning.

Professor Kinzer and student L. C. Aicher attended the Denver stock show last week.

Dr. T. J. Headlee lectured to the short-course students Saturday afternoon on the *Hessian Fly*.

The next catalogue of the College will publish the names of over 2300 students in attendance during the present College year.

Professor Dickens was reelected secretary and treasurer of the Kansas Good Roads Association at Topeka during State board week.

Professor Valley and his Choral Union have commenced training for their annual concert, which will be given some time in the spring.

The gymnastic exhibition of the College Y. M. C. A. gymnasium class in the Auditorium Monday evening was well attended and highly appreciated. The work by the class was a success—every number.

Hon. R. W. Goodman, of St. John, Kan., a member of the State Board of Agriculture and an extensive breeder of Duroc-Jersey hogs and Plymouth Rock chickens, spent a day looking over the College last week.

A Smith Gas Producer is being erected by the Mechanical Engineering Department to furnish gas for light, heat and power for gas engines in the different shops and laboratories of the College. When in operation it will produce 8000 cubic feet of gas per hour.

Professor TenEyck went to Sherman, Texas, last week to address the Texas Agricultural Association on corn breeding. From there he went to Stillwater, Okla., where he will speak to the farmers of that state on alfalfa. Professor Dickens also went to Stillwater to assist in the farmers' week program.

The Experiment Station is mailing Bulletins No. 156 and 157. The former is by the Department of Botany and treats of "The Yellow-Berry Problem in Kansas Hard Winter Wheats." The latter was prepared by the Bacteriology Department and reports the "Studies on Hog Cholera and Preventive Treatment" made by Prof Walter E. King.

The Manhattan Street-car Company has changed the main route to College, north of Y. M. C. A. Hall. They are now building west on Moro street, with the intention of entering the campus southeast of the Auditorium. From there they will skirt along the south wall to a point south of the new Domestic Science and Art Hall, and then go north to the power-house.

The removal of the Department of Bacteriology to their new quarters in the new Veterinary Science Hall has given the Zoölogy Department a chance to spread and get a laboratory large enough for the big classes in entomology.

The total number of books drawn for home reading from the Manhattan Carnegie Library last year was 26,085, and the total drawn for reading in the library reading room was 18,499. This is certainly gratifying for a young city, even if 83 per cent of the books read belong to the fiction class.

Speaking of the results of the work in seed breeding of Prof. H. F. Roberts and his assistants of this College, the *Kansas Farmer* says: "The modesty with which these investigators describe their progress and their expectations is characteristic of the true scientist. *Kansas Farmer* anticipates from their further work results of great value to the wheat growers of Kansas."

According to a writer in *Collier's Weekly*, the state college or university is fast outstripping the endowed school as an educational force in the nation. As proof he compares the enrolment of Harvard and Yale with the three state universities of Illinois, Texas, and Nebraska. While older colleges have been increasing 5575 students, the younger state institutions have rolled up 8469.

The preliminaries for the oratorical contest are over and the following were chosen to represent the different literary societies: Hamiltons, J. Z. Martin; Ionians, Miss Stella Hawkins; Websters, Harry Caldwell; Eurodelphians, Miss Georgie Randels; Alpha Betas, D. C. Bascom; Franklins, Jim Daniels; Athenians, Fritz Harri. The intersociety oratorical contest will be held in the College Auditorium, January 30.

Allen G. Philips is a hustler and he knows poultry. He and Mr. Lamb may congratulate themselves upon the complete success of the poultry institute. Prof. J. C. Kendall, W. H. Maxwell, of Topeka, C. C. Smith, Manhattan, Prof. J. O. Hamilton, Miss Katrine Krudop, Manhattan, Mrs. A. J. Pottorf, Riley, and other experts, presented papers, while the visitors had access to the model pens, houses and yards belonging to the College.—*Kansas Farmer*.

The Kansas Experiment Station has issued Bulletin No. 157, entitled Studies on Hog Cholera and Preventive Treatment, by Walter E. King, bacteriologist. The bulletin gives a careful review of work done in the quest for a means of preventing the terrible losses from hog cholera. While giving full credit for the investigations of others Professor King devotes the bulletin entirely to his own experiments and the interpretation of the results. It mentions extensive experiments still in progress in various parts of Kansas. Though quite technical, the descriptions of experiments may be fairly well understood by persons of ordinary education. Throughout the bulletin there is manifested conscientious regard for conservatism and accuracy of statement.—*Kansas Farmer*.

***Alumni and Former Students.***

L. W. Fielding and Crete Spencer, of the class of 1905, were married at the home of the bride's mother in Manhattan, Tuesday, January 12, 1909. The good wishes of a host of friends will follow them to their new home in Jonesboro, Ark., where Mr. Fielding is superintendent and manager of the Home Telephone Company.

The Orange Judd Company announces among its new books one on "The American Apple Orchard" by Prof. F. A. Waugh, '91, of the Massachusetts Agricultural College. While chief prominence is given to modern commercial methods as practiced in large and up-to-date orchards, a chapter is devoted to the family orchard. The book is written in the author's characteristic enthusiastic style and seems to meet a real need in horticultural literature.

The University of Wisconsin is sending out programs for the Women's Course in Home Making to be held there February 9 to 13, 1909. Mrs. Mary (Lyman) Otis, '94, is to be addressed for full information. Among those contributing to the program are Nellie Kedzie-Jones, '76, who gives three lectures on "Selection of Food for a Family," "A Woman's Education," and "Serving a Dinner;" Laura Day, '93, who lectures on "Business Management of a Home," and "Home Decoration and Furnishing;" and Abby Marlatt, '88, whose subject is "Home and School Training."

Doctor Walters has received a paper announcing the death of Darwin S. Leach, '81. This occurred in a hospital at Erokopondo, British Guiana, late in October, 1908. This news will bring a pang of regret to those who knew Mr. Leach as a student. He was one of the most brilliant men intellectually that the College has ever graduated. Well informed, incisive and logical, he was a formidable adversary in debate. Physically well proportioned and with a splendidly formed head, he was almost the beau-ideal of virile manhood. During his College days the questions of evolution and Darwinism were red-hot, and the furnace fires of debate were kept at full blast. Leach was with the radicals and doubtless exerted large influence over his fellow students. This was greater because he was of more mature years and of larger experience in life. In later years he freely testified to the great worth and service of such men as Professor Platt, from whom he differed so widely in many respects. Leach taught school for a time after graduation, and then went to the tropics, where he has since spent his life, and his College friends have heard little of him. Indeed, for many years he was supposed to be dead, but about two years ago he renewed communications, and since then has corresponded freely with several, and contributed articles to the *ALUMNUS*. He will probably always remain more or less a man of mystery. He seems to have become embittered by events beyond his control, and by cutting loose from the civilization with which his early friends are identified to have been unable to attain the eminence that his abilities promised and seemed to place certainly before him. Peace to his ashes!

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Take Them as They Come and Set Them Going!

THE  
**INDUSTRIALIST**

Historical Society

Vol. 35

No. 14

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**Kansas State Agricultural College**  
*Manhattan, Kansas*

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| GEORGE F. FREEMAN, B. S. (Ala. Polytech. Inst.).....                  | Assistant Professor of Botany             |
| GEO. C. WHEELER, B. S. (K. S. A. C.) .....                            | Assistant Professor of Animal Husbandry   |
| WILLIAM H. ANDREWS, A. B. (Univ. of Chicago) .....                    | Assistant Professor of Mathematics        |
| ROBERT E. EASTMAN, M. S. (Cornell University).....                    | Assistant Professor of Forestry           |
| LELAND E. CALL, B. S. (Ohio State University) .....                   | Assistant Professor of Soils              |
| L. E. CONRAD, M. S. (Lehigh) .....                                    | Assistant Professor of Civil Engineering  |
| K. W. STOUDER, D. V. M. (Iowa State College)....                      | Assistant Professor of Veterinary Science |

(Board of Instruction concluded on last page.)

# THE INDUSTRIALIST

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No. 14

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## *Take Them as They Come and Set Them Going.*

Every one understands that the Agricultural College is the place to which young men who wish to become farmers should go for an education. A large proportion of those who have but a superficial knowledge of the institution suppose that this is all that it is for.

The number of our citizens who do not know that young women constitute one-third of the students of the College is surprising. Keeping everlastingly at it has, however, let the great majority know that we have one of the great schools for the practical education of young women. Practical not merely that they may learn the useful art of housekeeping but, more important, that they may study the sciences that underlie the homemaker's art and at the same time put them in touch with the progressive world of industry in other spheres. Practical further in that, to some extent, they may enter the world of thought and culture afforded by history, literature, and music, and so share in the liberal education proposed for the industrial classes.

"The industrial classes!" What a tremendous army! The life-blood of the nations courses in their veins. The ceaseless call from the ranks finds here an exhaustless reserve of health and strength and sanity; of moral force, intellectual power, and unfettered initiative. How sublime the vision seen by Justin Morrill when he laid the foundation for the "liberal and practical education of the industrial classes!"

Yet many of us see only one aspect of this education proposed to be given the industrial classes. The accidental emphasis carried by a name has cut out the broader view. For ten years the College has been not only enormously increasing its efforts in purely agricultural education, but giving enlarged attention to other industries. That this enlargement is only an enlightened recognition of the duty and destiny of the land-grant colleges, established under the Morrill Act of 1862, should require no argument at this late date, and does not in most states.

There is a phase of the general question of education at the Agricultural College to which some good friends give too small weight. The industrial classes, for the education of which the College exists, are interested not only in those who come from the College with increased ability to do the world's work, and increased capacity to find pleasure as well as profit therein, but they are no less vitally involved in that they send the students to that College. The industrial classes furnish nearly all of the raw material from which the College makes a more or less elaborated product designed to go back to the industries. This is the point: We must take them as they come and set them going on a higher plane in the industrial life.

Whatever may be set forth as ideal, however, we may deplore the fact, a fact it is, that the early educational opportunities of the children of the industrial classes, especially those of the farmer's children, are not such as to enable them to meet generally the entrance requirements of the universities and colleges for the freshman year. At the present time the Agricultural College lacks about as much as its freshman year of requiring the fifteen units of high-school preparation required by many American universities. We are one year below in that respect. On the other hand, the sub-freshman year as it stands must be given at the College to the great majority of students who come to it, as the country schools do not prepare them even to that extent. Five years or more is a long time for the average member of the industrial classes to look forward to in providing college training for each of several children. Will he stand for more? Can he be expected to?

It is easy to say, "Raise the requirements for graduation and the preparatory schools will meet them," but will they, can they in this case? These questions cannot be answered by a mere tripping off the tongue; they require careful thought by persons familiar with all the conditions. No doubt many students would meet such an added requirement, but there would be an enormous falling off. Is it better for the State that a higher plane be reached by the few or that a more modest attainment be within the grasp of many?

The College policy has always been to keep within calling distance of the common schools, and by means of preparatory classes make the way straight and smooth to graduation for those who have the pluck to stay. Instead of stretching this distance by still another year the Regents last spring adopted the plan of adding a definitely formulated graduate year to each of the several courses. This year should bring those who complete it up to or

beyond the graduates of other schools in respect to technical studies. At the same time it affords opportunity for electing culture studies that up to that time have been denied because of the shortened entrance requirements. It may easily develop that this graduate year will be the stepping-stone to the requirement of another year for graduation, when the conditions of education in the preparatory schools warrant it.

In the meantime it is a satisfaction to know that our graduates are meeting those from any other institution and acquitting themselves with credit. They have been held down to longer hours of work during their four-years course, they are industrious as a rule, and graduation does not mean cessation of study but commencement of application in the world of industry with continued effort toward improvement.

J. T. WILLARD.

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### *The Law.*

AN ACT to locate and establish a college for the benefit of agriculture and the mechanic arts.

WHEREAS, The Congress of the United States, by an act approved July 2, 1862, and entitled "An act donating public lands to the several States and Territories which may provide *colleges* for the benefit of *agriculture and the mechanic arts*," granted to the State of Kansas, upon certain conditions, 90,000 acres of public lands for the endowment, support and maintenance of a college, where *the leading object shall be*, without excluding other scientific and classical studies, and including military tactics, *to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life*; and

WHEREAS, The State of Kansas by its legislature *has expressed its acceptance of the benefits of the said act of Congress, and has agreed to fulfill the conditions therein contained*: therefore,  
*Be it enacted by the Legislature of the State of Kansas: etc., etc.*

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As long as our College was small no objection was made to her offering technical branches in her curriculum, but since she has quietly and steadily grown until she is one of the greatest schools of her kind in the world, the University has become envious.

Those who seek to take the courses in question away from the Agricultural College offer as their reasons for so doing, the duplication of work, waste of money, and a misconception of the function of our institution.

We grant that there is a duplication of work, but it is the University that has been the aggressor along this line. Judge Story,

in an article to the governor some time ago, proved conclusively that K. S. A. C. is legally teaching engineering. The act organizing our school gives the Regents authority to provide for training along the lines of agriculture, mechanic arts, and kindred sciences. The Regents are lawfully providing for our Engineering Department.

On the other hand, the University can legally establish a department of agriculture, and the Chancellor of that institution has asked for the establishment of such a course. This request is merely a ruse to show the legal possibility of a needless duplication of work at the two institutions.

The friends of the University claim it should be the center of higher education of Kansas. This can never be unless all these schools are consolidated and located on one campus. This is now impossible, and if such a plan was ever carried out it must be conceded that Manhattan is the most logical and centrally located place in Kansas for such an institution. This, however, does not bear much on the subject at hand. In the three schools of higher learning supported by the State, six thousand young people are annually given the privilege of a higher education. Consolidate and centrally locate the three schools and the enrolment would be as in other states, where but one institution is maintained, about two thousand students. Can a state as great and as wealthy as Kansas annually deprive four thousand young people of the opportunity of receiving an education?

The one source of difficulty seems to be in the division of work so that no two schools will offer the same courses of study.

In commercial America the arts, sciences, mechanic arts, trades and professions are so nearly allied that he who seeks to draw fine distinctions between them has on his hands a tangled puzzle. America scarcely knows art for art's sake, pure science for its scientific charms, and so on through the list. Everything is learned and sold for dollars. The State has the three schools and is able to maintain them, and they are bound to overlap in their work to some small extent. General distinctions may be drawn and adhered to, but complete separation of the work is impossible.

Young men who desire to take engineering, or learn a trade, generally are not financially able to spend much money. Such young men can come to K. S. A. C. and receive as thorough and efficient training for much less money than at the University. They will also be a member of a democratic and unpretentious

student body and not forced to be nobody in a strange land ruled by caste and clan.

Let the Normal train the pedagogues, the University the artists, lawyers, pharmacists, doctors, scientists and journalists, and let K. S. A. C. produce the farmers, engineers, architects, printers, veterinarians, and skilled tradesmen.

Agriculture and the mechanic arts go hand in hand, for they are the great industrial pursuits followed by our people and should be taught to the young at the same school.

The University should cease her policy of trying to grasp every thing in sight for her own glory, rather than working harmoniously with her sister institutions for the educational uplift of the State who supports her. Until she does cease the State of Kansas is the sufferer.—*Herald.*

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***Saves \$100,000 Annually.—The Economy to Kansas of the Agricultural College in Cost of Education.***

There has been a good deal of misinformation scattered around concerning the Agricultural College and its work. There is an impression that it is a school where there is a good deal more attention paid to teaching other things than to instruction in agriculture. We have heard it said that the Agricultural College was teaching Latin and Greek. It is not. There was a time years ago when there was some Latin taught in the course but not recently. There is instruction in German.

It has also been stated only a few of the students became farmers after they left the College. The fact is that a larger proportion of the graduates of the Kansas Agricultural College become farmers after leaving the institution than of almost any other agricultural college in the United States. All young men who enter the College are required to take at least one year in the study of agriculture. The College offers six courses in agriculture as follows: Agronomy, which is another name for general farming; animal husbandry, dairy husbandry, poultry husbandry, horticulture and forestry, and veterinary science. There are also taught five courses in mechanic arts—mechanical engineering, electrical engineering, civil engineering, architecture, printing, domestic science, and general science. There are short courses in domestic science, agriculture and dairying for the benefit of students who cannot take the whole course.

The College has sent out to the farmers of the State during the past year more than 6000 bushels of seed—wheat, corn, oats, barley and other varieties raised and tested at the College, with

the idea of improving the yield of farm crops in the State. The members of the Faculty have had printed and delivered to the farmers of the State in the neighborhood of 200,000 pamphlets bearing on all sorts of subjects of practical interest to the farmers. Here are the names of some of them: "A Study of Corn," "Wheat Culture," "Seeding Alfalfa Seed," "Dry Land Farming," "Making Hay."

The figures show that the Agricultural College is the most economically conducted institution of its kind in the United States and at the same time it ranks as one of the greatest if not the greatest agricultural school in the world. Here is a comparison of the cost of educating students at some of the leading agricultural colleges of the United States per annum. At the agricultural college of Colorado it costs \$253 per student per annum; in Indiana the cost is \$175 per student; in Iowa, \$191 per student; in Michigan, \$330; in North Dakota, \$178; in Oklahoma, \$177; in South Dakota, \$195; in Kansas, \$111. The cost per student is 41 per cent below the average cost in other agricultural colleges.

It is also much less than the cost per student at any of the state universities. The cost per student at our own university is \$165 per student, which is below the average, but is \$54 per student higher than the cost at the Agricultural College, which knocks out the argument that the State could better afford to educate all of its students at the University. As a matter of fact, according to the showing made by the State University and the Agricultural College it would cost the State more than a hundred thousand dollars per annum in excess of the present cost if the Manhattan student body were moved down to Lawrence.—*Mail and Breeze.*

### ***Courses in Agricultural Colleges.***

In view of the prevailing discussion concerning the proper work at this College it may be interesting to call attention to the fact that at only three Agricultural Colleges in the United States are engineering courses not taught. Many of the Agricultural Colleges are parts of State Universities, and in all those cases the Agricultural Colleges meet the competition and stimulus of the engineering courses. In twenty-eight of the states and territories the Land-Grant College is located separately from the State University. At those institutions a great variety of courses is offered, ranging from the old classical course to the brief, wholly utilitarian short course. For convenient inspection the most characteristic of these are exhibited in a table herewith, and those taught at each of the several institutions indicated by a plus +.

THE FOLLOWING TABLE SHOWS MOST OF THE COURSES GIVEN IN THE LAND-GRANT COLLEGES NOT CONNECTED WITH UNIVERSITIES.

Note particularly the large number of courses in agriculture given in Kansas and Iowa as compared with other states.

### *A Bug Under the Chip.*

The talk about "economy of administration" and "greater prestige" which is going the rounds now as a part of the effort to make the Agricultural College of Kansas a part of the Kansas University does not sound good to those who know anything about it and are not partisans of either school.

When the University was getting regularly from the State about twice as much money as the Agricultural College the Lawrence people, and those politicians affiliated therewith, were not so much concerned about "economizing" the administration of affairs at Manhattan or in giving the "Farmers' school" as they called

it, "greater prestige." Of late years, however, the men who pay the taxes have been making it a part of their business to see that the Agricultural College gets a square deal, and now it is the subject of much solicitude. But the reasons given are "for external use only"—by those who know what the reasons really are. Lawrence may have to lose its dam, when the waterway's investigation gets to going, and if it could annex the Kansas Agricultural College it would not be doing so badly.

The fact is that, all things considered, the College at Manhattan is the most popular educational institution in the State. It has the largest grounds, the most money in buildings and equipment, and serves the most people. With regard to economy of administration it is interesting to note that the cost of education, per student, is lower at Manhattan than at almost any other of the big institutions that have a right to be counted in the same class. As to prestige, a comparison of the number of Agricultural College graduates holding important positions in government service and in other colleges with the number from other schools of the country does not indicate that the Kansas "Aggies" are black-listed to any great extent.

We hope—and expect—to see the legislature give this movement the black eye that it deserves.—*Breeders' Special.*

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### ***Hear! Ye People of Kansas.***

Chancellor Strong of the University has opened the expected attack upon the Agricultural College. The fight is started on the Engineering Department, but it is directed at the whole institution. It is based on the plea of economy, but it is really based on the desire of the University to hog the whole business.

What are the comparative rights of the two institutions?

First. The Agricultural College was founded first.

Second. The Agricultural College is more centrally located.

Third. The College student can and does live more cheaply at Manhattan than at Lawrence.

Fourth. The cost of building is from 25 to 40 per cent greater at the University than at the Agricultural College. A little comparison of appropriations for building and the results obtained will make this plain.

Fifth. The cost of maintenance, which means the cost of the education given by the State, is much greater at the University than at the Agricultural College, even though the College has the larger enrolment and large outside demands.

Sixth. The Agricultural College, by the terms upon which it

was established by the State, and by reason of which the State received a great land grant, was to be a College where agriculture and the mechanic arts must be taught, and all other subjects might be.

The University, established some years later, claims the whole field because its name means "universal."

The Agricultural College has followed the general lines of agriculture and mechanic arts, as originally laid out, and for years the University pursued the old university policy of teaching the dead languages. Suddenly the education that fitted a man for work in the world blazed into great popularity. The Agricultural College, in spite of the handicap of small appropriations and internal trouble, grew by leaps and bounds, until the University fell behind. K. U. is battling now, not to attain leadership by superior merit, but by somehow crippling the Agricultural College.

*Will the people of Kansas permit this to be done?*

The Agricultural College asks to be allowed to continue its great growth in the field mapped out for it—agriculture and the mechanic arts. It does not complain that the University has crowded, and is constantly trying to crowd further into this field. But if one or the other must give way, then the Agricultural College feels, because of priority, of central location, of economy in instruction, of economy in student life, and a regard for the good faith of the State with the general government, that the University keep out of the field of practical agriculture, horticulture, engineering and all other mechanic arts, and confine itself to the rest of its advertised 400 courses of study and leave the Agricultural College its dozen or fifteen.—*Republic.*

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### ***Tendencies at the Agricultural College.***

It has been thought by some that the engineering courses at this institution exert a seductive influence of some kind upon the young men and lead them away from the courses in agriculture. No such tendency has ever been noticed by those on the campus. In fact, attractions of a special character are altogether toward agriculture courses rather than otherwise. Among these are corn-judging and stock-judging contests at the College, at the American Royal Stock Show at Kansas City, the International at Chicago, and those at other places. All these means of achieving special distinction and honors are in connection with agricultural courses, and there is nothing to offset it in connection with the other courses. Many young men come here with the intention of taking one of the engineering courses and later change their

plans and enter upon an agricultural course, but a student who comes here with the intention of taking an agricultural course and subsequently takes an engineering course is very hard to find.

A few years ago an investigation conducted by the professor of agriculture showed that of the students then in the four-year course in agriculture 42 per cent had entered College with the expectation of taking a different course. Last Thursday a general inquiry was made among all the young men of the institution, cards being distributed in all classes with blanks to be filled by each young man so as to show the course which he intended to take when he came here and the one which he is now taking or planning to take. As the differentiation in the courses does not occur until the sophomore year and the formal choice is not made until the beginning of that year, all data collected for freshmen and lower classes represent intentions only. The following table shows the results, with comparatively few yet to hear from:

CHANGES OF COURSE BY YOUNG MEN.

| CLASSIFICATION.    | From Engineering to<br>Agric. Short Course.. |                                         | From General Sci-<br>ence to Agriculture. |       |
|--------------------|----------------------------------------------|-----------------------------------------|-------------------------------------------|-------|
|                    | From Engineering<br>to Agriculture.....      | From Agriculture<br>to Engineering..... |                                           |       |
| Senior .....       |                                              | 7                                       | 3                                         | 2     |
| Junior.....        |                                              | 14                                      | 10                                        | 2     |
| Sophomore.....     |                                              | 22                                      | 5                                         | 2     |
| Freshmen.....      |                                              | 17                                      | 7                                         | 1     |
| Sub-freshmen.....  | 2                                            | 9                                       | 1                                         | ..... |
| Preparatory.....   |                                              |                                         |                                           | ..... |
| Special.....       |                                              | 1                                       |                                           | 1     |
| Short Courses..... |                                              |                                         |                                           | ..... |
| Totals.....        | 2                                            | 6                                       | 26                                        | 5     |
|                    | 4                                            | 70                                      | 6                                         |       |

From the above statement it will be seen that nearly all of the changes are away from engineering, and that at present there are in agricultural courses 43 students who came here with the expectation of taking engineering courses, and that not one who came here with the intention of taking an agricultural course has changed to an engineering. The general science course has received 16 students who came to take engineering courses. The totals shown in the table show the changes if we include prospective as well as actual.

The utter baselessness of the supposition that students are diverted from agricultural to engineering courses could scarcely be more forcibly demonstrated.

***Tree Planting Institute.***

The Agricultural College for thirty years has been promoting tree planting in Kansas; working out experiments in varieties of trees, methods of planting and cultivation, and in instructing students and farmers in forestry. The farmers' institutes have been discussing the subject for three years, leading up, in the opinion of the superintendent of institutes, to the necessity for a general day for this one subject.

Therefore, *Saturday, February 13, 2:00 to 4:00 P. M.*, is recommended as a day for *Tree Planting Institutes*. All county and local institutes (now two hundred twenty-three) are invited to meet on that day and at the hour named to discuss this subject. The following topics are suggested: (1) Best trees for this locality for (a) Shade, (b) Windbreaks, (c) Posts, (d) Fuel. (2) Best localities for different varieties. (3) Preparation of ground for planting. (4) Best time to plant different trees. (5) Best methods of planting different trees. (6) Caring for trees during the first summer, mulching or cultivating. (7) Brief "experiences" with catalpa, honey-locust, cottonwood, Russian mulberry, white ash, black locust, pines, box-elder, elm, walnut. (8) Why not plant one hundred walnuts on every farm in Kansas, a hundred locust (honey or black), a hundred catalpas, a hundred cottonwoods, a hundred elms, a hundred of other varieties—six hundred trees on every quarter-section? (9) What would it cost, and would it pay? (10) What effect would it probably have on appearance and value of farm, evaporation of moisture from soil. (11) What would these plantings be worth on market at end of ten years? Twenty years? Send in names of those who expect to plant this year at least one hundred forest trees.

Are you in favor of a State Forestry Commission and a State Forester, appointed by the Governor, or would you prefer to have this work directed by the Agricultural College? Would you or would you not favor the ceding of the Forestry Stations at Dodge City and Ogallah to the Agricultural College for general Experiment Station use, *including forestry*, to be handled as are the farms at Manhattan and Hays, and as the farm at Garden City is to be handled, all farms to be under the control of the Board of Regents and directed by the Director of the State Experiment Station work, trees to be distributed by a forester appointed by the Regents?

Please call for vote on the above and report the vote to me and to your local papers.

*Kansas State Agricultural College.*      *Supt. Farmers' Institutes.*  
*Manhattan, Kan., January 26, 1909.*

***Local Notes.***

Over 2000 enrolled this term.

The mid-term examinations will be held Saturday, February 13.

Regent W. E. Blackburn was at the College on business last Thursday.

The Ag. Association has challenged the Vet. Association to a basket-ball game.

The next annual meeting of the State Veterinary Association will be held at this College.

Professor Cortelyou is working up a fine schedule for the base-ball team for the coming term.

The blizzard of Thursday night blew down about a third of the board fence of the Athletic Park and bent the iron flag mast.

The Domestic Art Department is making preparations for another exhibition of handwork at the end of the winter term.

The Manhattan *Mercury* has bought a linotype and secured an Associated Press membership in order to change to a daily. The first number will appear in a few days.

Missouri State University and the Agricultural College will play a game of basket-ball at Manhattan on Tuesday, February 2. It will undoubtedly be an interesting game.

Prof. H. F. Roberts has completed his report on the results of his European trip made last summer for the purpose of studying their methods of wheat raising and seed breeding. It will be mailed in a few days.

The Agricultural College basket-ball team records another victory. Thursday of last week it overwhelmed the Indians of Haskell Institute in a hotly contested game at the Y. M. C. A. gymnasium. The score stood 55 to 16.

The new gas producer and tank were installed several weeks ago, but the operation of making gas was retarded on account of leaks in the gasometer. The boiler makers are still at work on the various fixtures. The tank has a diameter of 20 feet and a height of 13 feet.

The present senior class numbers 134 members, the junior class 234 and the sophomore class 370. There are 25 special students enrolled and about that many graduate students. Nearly 300 students are taking work in the short courses in agriculture, domestic science and art, or dairying.

Our basket-ball team will take a trip out of the State for the first time in the history of the College. They go to Lincoln, Neb., March 8, for a game with the Nebraska Wesleyan. The following evening they will play Cotner University. The season of the N. S. U. will close before that time, so that no game can be secured with them.

Professor Scheffer, of the Department of Zoölogy, has for a year or two made a special study of the mole, its habits, its food, and the different methods of its extermination. He is making an analysis of one hundred mole stomachs to determine the character of its food and intends to publish a bulletin on the rodent in the near future.

The Heat and Power Department has in operation this month two stokers, one Jones Underfeet and one Green Traveling Link Grate. It is fortunate that these were installed when the cold weather arrived. It was a difficult matter to get the necessary coal this winter, and the stokers enabled the firemen to burn slack, of which there was an abundance in the market.

It has been proposed to give the year-books of the senior classes of the College a permanent title, as has been done by many other institutions. The Minnesotas have named theirs "The Gopher;" the Iowas call theirs "The Bomb;" the Washburns publish "The Kaw." Those wishing to propose a name for the College annual should send their suggestions to Miss Mary Copley, at the post-office.

#### *Alumni and Former Students.*

Nellie J. Murphy, of the class of 1885, died at Sterling, Kan., January 6, 1909. We have no further particulars in reference to the sad event.

C. A. Murphy, '87, has quit the newspaper business, at least for the present, and is now teaching mathematics in the Reno county high school, at Nickerson.

W. J. Lightfoot, '81, United States examiner of surveys and special disbursing agent, Department of the Interior, has a thirty-day furlough and is spending most of it with his family in Manhattan.

F. L. Bates, '04, was admitted to the bar by state examination January 21. Mr. Bates was married, December 25, 1908, to Miss Pearl Anna Bird, of Ann Arbor, Mich., and they are now making their home in Manhattan.

J. E. Payne, '87, superintendent of the United States Experiment Station at Akron, Colo., after spending some weeks in Washington, D. C., stopped off here and caught up with the news as he was returning to his station. He speaks highly of the work of his assistant, W. G. Shelley, '07.

G. H. Failyer, '77, assistant in the Bureau of Soils, U. S. Department of Agriculture, is leading author of Bulletin No. 54 on "The Mineral Composition of Soil Particles," which has just been issued by the Bureau of which he is a member. The bulletin treats of the occurrence of recognizable particles of the rock-forming minerals in arable soils. It has a practical value in that these minerals are sources of the continued fertility of the soil.

*Board of Instruction (concluded).*

|                                                                 |                                        |
|-----------------------------------------------------------------|----------------------------------------|
| Miss Ada Rice, B. S. (K. S. A. C.)                              | Instructor in English                  |
| Miss Ella Weeks, A. B. (U. of K.)                               | Instructor in Drawing                  |
| Miss Daisy Zeininger, B. A. (Fairmount)                         | Instructor in Mathematics              |
| Leonard W. Goss, D. V. M. (Ohio State University)               | Instructor in Veterinary Science       |
| Miss Ula M. Dow, B. S. (K. S. A. C.)                            | Instructor in Domestic Science         |
| Theo. H. Scheffer, A. M. (Cornell University)                   | Instructor in Zoölogy                  |
| Herbert H. King, M. A. (Ewing College)                          | Instructor in Chemistry                |
| John B. Whelan, M. A. (Nebraska)                                | Instructor in Chemistry                |
| Louis H. Beall, A. B. (Denison)                                 | Instructor in English                  |
| Roy A. Seaton, B. S. (K. S. A. C.)                              | Instructor in Mechanical Engineering   |
| William L. House                                                | Foreman of Carpenter Shop              |
| Louis Wabnitz                                                   | Foreman of Machine Shops               |
| Miss Ina E. Holroyd, B. S. (K. S. A. C.)                        | Assistant in Preparatory Department    |
| Ambrose E. Ridenour, B. S. (K. S. A. C.)                        | Foreman of Foundry                     |
| Miss Emma J. Short                                              | Assistant in Preparatory Department    |
| Miss Ina Cowles, B. S. (K. S. A. C.)                            | Assistant in Domestic Art              |
| Miss Kate Tinkey                                                | Assistant Librarian                    |
| Earl N. Rodell, B. S. (K. S. A. C.)                             | Assistant in Printing                  |
| M. Francis Ahearn, B. S. (Mass. Ag. College)                    | Assistant in Horticulture              |
| Miss Gertrude Stump, B. S. (K. S. A. C.)                        | Assistant in Domestic Art              |
| M. Sheldon Brandt, Ph. B. (Yale)                                | Assistant in Architecture and Drawing  |
| Chas. Yost                                                      | Assistant in Heat and Power Department |
| Earle B. Milliard                                               | Foreman of Blacksmithing               |
| J. T. Parker                                                    | Assistant in Woodwork                  |
| J. D. Magee, A. M. (Chicago)                                    | Assistant in Mathematics               |
| E. G. Meinzer, A. B. (Beloit)                                   | Assistant in German                    |
| Miss Florence S. Latimer, B. M. (Ferry Hall Seminary)           | Assistant in Music                     |
| Miss Marjorie Russell (Mechanics' Institute)                    | Assistant in Domestic Science          |
| Burton Rogers, D. V. M. (Iowa State College)                    | Assistant in Veterinary Science        |
| Miss Clara Willis (Framingham Normal)                           | Assistant in Domestic Science          |
| C. O. Swanson, M. Agr. (Minn.)                                  | Assistant Chemist, Experiment Station  |
| Edw. C. Crowley, Ph. B. (Yale)                                  | Assistant in Chemistry                 |
| Hugh Oliver                                                     | Assistant in Heat and Power Department |
| Miss Charlaire Furley, B. A. (Fairmount)                        | Assistant in English                   |
| Miss Jessie Reynolds, A. B. (U. of K.)                          | Assistant in Preparatory Department    |
| Miss Mary F. Nesbit, A. B. (Illinois University)                | Assistant in Mathematics               |
| Miss Annette Leonard, A. B. (U. of K.)                          | Assistant in English                   |
| William C. Lane, B. S. (K. S. A. C.)                            | Assistant in Electrical Engineering    |
| Miss Flora C. Knight, A. B. (Uni. of Wyoming)                   | Assistant in English                   |
| Miss Grace H. Woodward (Boston School of D. S.)                 | Assistant in Domestic Science          |
| Miss Nellie Cave, B. M. (Univ. of Nebr.). (Chicago Music Coll.) | Assistant in Music                     |
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(Board of Instruction concluded on last page.)

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No. 15

## ***Distribution of Improved Seed-Wheat by the Kansas Experiment Station.***

The attention of those interested in wheat growing is called to the work which has been done in this State by the State Experiment Station in the distribution of improved seed-wheat.

In 1902, there was no work in progress at the Station in testing and growing cereal grains. A large number of varieties of wheat and other small grains had been tested at the United States Government Station at Halstead (now at McPherson), and a single trial of some fifty varieties of hard red Russian wheat had been made at the Fort Hays Branch Station in Ellis county. Most of these varieties had been secured from the United States Department of Agriculture, and were collected by Prof. M. A. Carleton, who was for several months collecting choice samples of wheat in Russia, Roumania, and other European countries.

In the fall of 1903 some forty samples of the best producing varieties of winter wheat, as shown by the tests at Fort Hays and McPherson, were secured and planted in trial plots at Manhattan. Amongst these was the now famous Kharkof, introduced by M. A. Carleton from the province of Kharkof, Russia, in 1901, a hard, red, winter wheat of the Turkey type, which has proven to be one of the best producing varieties at all three stations.

In 1905 seed of this variety and seed of several others which had produced well, were planted in separate fields, and in 1906, 1152 bushels of selected and graded seed-wheat were distributed among 192 farmers in 60 counties of the State. In 1907 the Agronomy Department produced and distributed 1529 bushels of seed of these better producing varieties, and 1162 bushels were distributed in 1908, making a total distribution of seed-wheat by the department of 3995 bushels, among 638 farmers, in 99 counties.

The name and address of each purchaser has been recorded and circulars have been sent out each year asking for a report and urging farmers to save their crop for seed and thus hasten and extend the distribution. In this way several thousand bushels of this improved wheat were distributed and planted in the fall of

1907. In 1908 a special effort was made to have a large part of the crop saved for seed. Soon after harvest circulars were sent to all those who had purchased seed-wheat from this Station, asking for a report on their crop, and again urging them to save the wheat for seed and also requesting them to report to the Agronomy Department the amount of seed, its purity, and quality. More than 100 replies were received to these letters and some 50 were listed as having from 50 to 3000 bushels of seed-wheat, aggregating some 20,000 bushels, for sale at prices ranging from \$1.00 to \$1.50 per bushel. (The higher price was for graded seed.)

This list was sent to a large number of inquirers for good seed-wheat, including many millers, and reports from several of the parties listed indicate that the larger part of this wheat was sold for seed and planted last fall. A number replying to the first request for a report stated that their wheat had all been spoken for by their neighbors. Others who had a large acreage to plant stated that they would need all the seed which they had produced for their own use. Only two replies out of a large number received were unfavorable to the wheat, and some of the replies were very favorable indeed. Quotations from some of these are as follows:

"The Kharkof wheat is more vigorous than other varieties—will yield about 25 bushels per acre this season on upland."—J. A. Akin, Rantoul, Franklin county, Kansas.

"The Kharkof wheat will yield three to five bushels more than other varieties grown here."—John Antene, Ada, Ottawa county, Kansas.

"The Kharkof wheat is one-third to one-half better than wheat from my own seed."—John Balderson, Day, Washington county, Kansas.

"Kharkof wheat yielded 32.5 bushels per acre—made about eight bushels per acre more than the White Russian grown beside it."—W. H. Benton, Kiowa, Barber county, Kansas.

"Your Improved Turkey Red wheat yielded 29.8 bushels per acre and is more vigorous than other varieties; will yield one-third more than other wheat in the neighborhood."—O. B. Vincent, Alden, Rice county, Kansas.

"Sowed three varieties of your College-bred wheat—Bearded Fife, Kharkof, and Improved Turkey Red. Consider each of these varieties superior to common wheat here."—W. R. Moody, Harper, Harper county, Kansas.

"Kharkof wheat will yield three to five bushels more than other wheats."—D. W. Reazin, Macksville, Stafford county, Kansas.

"Kharkof wheat is better than other good wheat and a great deal ahead of the average."—Carl Strafuss, Pomona, Franklin county, Kansas.

"Kharkof wheat is better than surrounding fields; matured several days earlier; will yield 5 to 10 bushels more than other wheats."—C. C. Trostle, Nickerson, Reno county, Kansas.

"My Kharkof wheat is the best wheat in this neighborhood."—Mrs. N. V. Spillman, Bluemound, Linn county, Kansas.

Kharkof wheat is far superior in yield to other wheats; well pleased with the variety."—P. H. Mahon, Clyde, Cloud county, Kansas.

"Malakoff wheat sown on my farm made a much better crop than other varieties; seemed hardier; straw was long enough to bind, while other wheat had to be cut with the header. Yield, 24 bushels per acre, making four to eight bushels more than other wheat. This crop was grown on upland."—C. L. Hendricks, Glen Elder, Mitchell county, Kansas.

"From the 10 bushels of seed-wheat which I secured from you in 1907 I threshed 554 bushels of fine wheat (Kharkof). Sowed 50 acres last fall and have just threshed 1057 bushels of 60-pound wheat, which is pretty good, considering the season. Other wheat in this locality made about 8 to 12 bushels per acre."—C. M. Sherman, Protection, Comanche county, Kansas.

"Sowed your Bearded Fife wheat in 1906 and it yielded 30 bushels per acre. In 1908 it yielded 44 bushels per acre. I led the community both seasons."—M. G. Hamm, Holton, Jackson county, Kansas.

"Kharkof wheat secured from you in 1906 yielded 10 bushels per acre more than other wheat grown on same land."—W. H. Derr, Covert, Osborne county, Kansas.

The following is the report of several of the better producing varieties at this Station:

VARIETY.	Average yield per acre, bushels, 1907-1908.	Average yield per acre, bushels, 1904-1908.
Kharkof, No. 382.....	44.68	42.01
Defiance, No. 373 (Turkey wheat).....	43.34	41.84
Bearded Fife, No. 366 (Turkey wheat).....	40.37	41.17
Turkey Red, No. 380.....	42.14	40.95
Malakoff, No. 368.....	41.05	40.19
Red Winter .....	42.15	40.10

It will be observed that the Kharkof wheat leads in yield both for the period of two years and for the period of five years. However, several other varieties proved to be very good producers and have given good results, as indicated by the above report and by the reports of growers noted above.

The Kharkof wheat has been an excellent producer, as shown by comparative trials at McPherson and at the Fort Hays Branch Experiment Station, and in a number of coöperative tests with farmers carried on by this department.

The Kharkof wheat is also a very excellent flour-making variety. Prof. J. T. Willard, Station Chemist, reports milling tests of three samples of Kharkof wheat and five samples of Turkey wheat as follows:

NAME.	Grains per ten grams.....	Specific Gravity.....	Per cent total flour.....	Per cent patent flour.....	Per cent sec-ond-grade flour.....	Per cent low-grade flour.....	Per cent bran.....	Per cent shorts..	Pounds flour per bushel.....
Kharkof.....	348.2	1.3472	75.89	51.81	22.05	2.03	17.86	5.32	0.93
Turkey*.....	379.8	1.3539	75.37	52.47	16.23	6.65	18.47	5.32	0.83

\*Three samples from wheat recently imported.

Tests of high-grade flour at other experiment stations have shown a higher percentage of patent flour, but the lower percentage of patent in all of Professor Willard's tests is explained by the fact that the processes of separation used at this Station have not been perfected. However, the trials are comparative, and among a large number of samples tested the Kharkof ranks among the best.

In the baking tests carried on at this Station the Kharkof flour has been equal or superior to other samples tested. Its absorption ranged from 55 to 57 per cent; its rising capacity from 79 to 83 per cent, and Professor Willard pronounces it a strong flour.

On account of its general adaptation, hardiness, and good producing qualities, as well as its excellent flour-making qualities, the Kharkof has been chosen as the best variety for general distribution, and larger quantities of it have been distributed among the farmers of the State than of other good producing varieties.

Nearly 4000 bushels of improved seed-wheat, largely Kharkof, have been distributed by the Fort Hays Branch Station and a limited quantity by the United States Coöperative Experiment Station at McPherson.

Considering these facts it is a conservative estimate to assume that at least 160,000 acres of the Kharkof and other improved varieties are now growing in the State. At the rate of 25 bushels per acre, this acreage will yield four million bushels of improved seed-wheat which may be distributed next fall, or enough seed, if it is carefully distributed, to plant one-half the total wheat acreage of the State.

Little of this improved wheat has, as yet, come to the mills, since it has been used largely for seeding purposes. It will begin to come to the mills next fall, and by the fall of 1910 large quantities will be sold for milling purposes and the problem of seed-wheat improvement in Kansas will have been solved.

Prof. H. F. Roberts, of the Kansas Experiment Station, has recently published the statement regarding the wheat breeding work of the Botanical Department—that in five years, through the breeding and selection which is now being carried on, he will have ready for distribution seed-wheat which is much superior to the Kharkof.

The Agronomy Department now has the second crop growing from choice head selections which in the head-row breeding plot proved to be much superior to the average Kharkof wheat. It is expected that in three years from last fall this department will have a thousand bushels or more of an improved strain of Kharkof

wheat superior, both in yield and in flour-producing quality, to the average Kharkof wheat which is now being grown for distribution.

The Experiment Station is solving the problem of better seed-wheat. Of the hundreds of varieties of imported wheat tested at the several Experiment Stations of this State, comparatively few have proven superior. It would be practically impossible to secure pure importations of these best samples in large quantities. The average wheat which comes to us from Russia is usually inferior in quality, mixed in breed, and often full of noxious weed-seeds. The Kharkof wheat grown in the State to-day is better than the original sample, being both purer and of better quality and of greater yielding capacity.

To those who have not heard of this work, the above may seem like a fairy story, yet it is true and the station can furnish the names and addresses of 600 or more farmers who have secured the wheat from this Station and who can testify to the facts stated. Moreover, many of these 600 farmers can doubtless furnish scores of names of others who have purchased seed-wheat of them during the past few years. Similar data may also be secured from the Fort Hays Branch Station.

Just a word regarding the Seed Wheat Investigation Bill passed by our State Legislature two years ago. Following out the provisions of the bill, the Board of Regents sent Professor Burkett and Professor Roberts to European countries to study the wheat problem there, and the writer was sent to Alberta, Canada. The reports of these investigations have been published in press bulletins 157, 164, and 171. The conclusion of each of the investigators was that it would not be advisable to import wheat from any of these countries in large quantity. Each has recommended small importations, testing of varieties, and the breeding of wheat at our own Experiment Stations and distributing the improved seed-wheat to the farmers of Kansas—a work which is now in progress.

It is not true that this work in wheat improvement has just begun at this Station, and it will not take five or six years to secure seed for distribution improved by our breeding and selection. The wheat farmers of the State can be supplied with two to three million bushels of improved seed for next fall's planting through the Agronomy Department of the Kansas Experiment Station.

If it seems advisable at some future time to give our improved wheat in this State a vacation in Russia or Alberta in order to improve it in quality, this may be done. In fact, there is now growing in Alberta over one hundred acres of "pure-bred" Khar-

kof and Turkey Red wheat that came from Kansas. This wheat is in the hands of the Canadian government Experiment Station, and if it is desirable to secure some good pure seed of Kansas Alberta-grown wheat of the best producing varieties, it can be done in the course of a couple of years, but it would not be advisable to import at once large quantities of Alberta wheat, even though it is superior in quality to the average Kansas seed-wheat, because, as shown in Press Bulletin No. 157, this wheat is not pure. It was originally Kansas "scrub" wheat which was taken to Canada and which has since become even more impure by becoming mixed with volunteer Odessa wheat in Canadian fields.

Several samples of Alberta wheat were planted in our trial plots in the fall of 1907. Compared with the Turkey and Kharkof, the yield was very good, but the quality of the grain was not superior to that produced by our home-grown seed. Two car-loads of Alberta wheat have been distributed in Kansas during the last two years by two milling companies, and the Agronomy Department was furnished with a list of farmers purchasing this wheat. They were asked to make a report of their crop. A number have made quite favorable reports, while others condemn the wheat as being no better than the average Turkey wheat. At least, so far as data at present indicates, no particular advantage would be derived from importing large quantities of Alberta wheat to take the place of our improved Kharkof and Turkey varieties.

It will not be to the best interests of the State to establish any Agricultural Commission which shall not be a part of the State Agricultural College and Experiment Station. If the farmers and legislators of the State desire that more attention be given to certain agricultural problems, let the State Legislature pass resolutions to that effect, authorizing the State Experiment Station and the proper authorities connected therewith to undertake such work, and the same time appropriate funds so that men and means may be had to carry on such work.

It will be observed that the methods of distributing improved seeds inaugurated and now being carried on by this Experiment Station encourages individual effort. The farmer is made a coöperator in the further growing and distributing of improved seeds, which results in not only educating the farmer in better farming methods, but at the same time becomes a source of income and profit to him in his farming business.

The possible good which may result to the agriculture of this State from crop breeding is incalculable, and the work should re-

ceive the hearty support and coöperation of every farmer in the State and every representative and senator in our State legislature.

There is room for improvement in our Experiment Station work and methods. There should be several permanent sub-stations in different parts of the State which may be used as seed breeding distributing stations. Seeds grown at Manhattan, Fort Hays or McPherson are not equally well adapted for growing in all parts of Kansas.

Experiments should be undertaken to find where the best seed-wheat and seed-corn may be grown in Kansas as to soil, climate, etc., and when this is determined seed propagating and distributing stations should be established in these favored locations; not with the purpose of making a monopoly of the business and supply all of the improved seed, but simply to begin the work of breeding and dissemination of new and improved varieties, leaving the farmer and local seedsman to carry out the distribution of large quantities.

A bulletin on seed distribution is now in process of preparation. This bulletin will contain a history and description of each variety and of each kind of seed which has been distributed, and the names and addresses of all the purchasers, with the kind and amount of seed purchased.

Reports of the experimental work in testing varieties of small grains are published in Bulletin 144. Similar information regarding experiments with and the breeding of Indian-corn is published in Bulletin 147, copies of which bulletins are still available.

A. M. TEN EYCK.

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### *A Visit by the Law Makers.*

A mass meeting of the students was held in the College Auditorium Tuesday of last week, attended by two thousand, at which it was decided to invite the members of the legislature to visit the College in a body. The plan was to hire a special train and pay the expenses of the entire membership of both houses —165—on the trip. Students A. G. Kittell, J. Danielson and W. Hopper were elected as delegates to go to Topeka to extend the invitation to the law makers. The students felt that if the members of the legislature could see what the State owns here and what work the College is doing the future of the institution would be safe.

Representative Westgate presented the invitation in the House and Senator Hostrup in the Senate, and the invitation was accepted without an argument. The general feeling of the legis-

lators was that if the students of this great institution had gone to the expense of providing a free special train they ought to be glad to take the opportunity to go and see them.

The special train arrived at Manhattan over the Union Pacific railroad last Wednesday morning at 10:30 and the members, together with their ladies, were hauled to the College by the Manhattan Commercial Club, which had provided a dozen automobiles and dozens of "busses," hacks, and carriages. Here they were turned over to the students, who entertained them and showed them the different departments of the institution. They first went to the north part of the campus to inspect the stock, the barns, the poultry houses, pens, and dairy stables. At 11:30 they assembled in the Auditorium to attend the chapel exercises. The legislators were seated on the rostrum and had a chance to look into the four thousand eyes of the healthiest and brightest student body in the world. It was a grand and overpowering sight for all of them. After the usual program of chapel President Nichols arose, called on a number of the members for short addresses and all of them, inspired by the occasion, responded with spirited and well-put remarks. The gentlemen who spoke were Lieut. Gov. W. T. Fitzgerald, Senators C. S. Huffman and S. M. Brewster, Speaker J. N. Dolley, Speaker-pro tem John S. Hopkins, Representatives A. C. Mitchell, C. F. Foley, C. F. Lauderback, and A. F. Cranston. The trend of the addresses was nearly the same. The legislators said that they were surprised at the size of the institution, at the large student body, at the many evidences of a healthy and active student life, and at the practical and progressive spirit manifest everywhere. They assured the students that the Kansas legislature would never consent to a division of the great technical school at Manhattan, and that they were willing to protect it from any and all attempts at diminishing its usefulness. Some of the speakers deplored that they had been misinformed about the scope and character of the College and said that they were glad now that they had come here to see for themselves. Speaker Dolley spoke approvingly of the great work of President Nichols in fighting for the life of the College entrusted to his care, and Representative Mitchell, who is a regent of the State University, expressed the hope that a rich State like Kansas would never refuse ample appropriations to all of its higher institutions of learning—the College as well as the University. The enthusiasm of the students did not abate during the lengthy session. They listened to the spontaneous professions

of good will with undivided attention and attested their concordance of feelings with repeated thundering applause.

From the Auditorium the visitors, to the number of 302, were escorted to the new Domestic Science and Art Hall where Mrs. VanZile and her classes in domestic science had prepared a dinner of several courses for all of them. The girl students, dressed in their usual domestic science gowns, waited on the tables, and there was plenty for all who had come. The bountiful dinner was but another illustration of the fact that the College is not simply an aggregation of class-room theory, ancient mythology, and dead languages.

In the afternoon the legislators were shown through the extensive shops, the library and the printing-office and at 3:00 they attended the drill and dress parade of the College battalion. Our freshmen to the number of six full companies, headed by the cadet band of about forty members, never appeared better. They drew many words of comment from the law makers, whose hoary heads in many cases testified of their personal interest in the blue uniform which they had worn when they carried the stars and stripes through the swamps and woods of Dixie. Late in the afternoon the locomotive waiting on the Union Pacific track called for its load of happy visitors, and they left the campus—everyone of them pledged to do his best for the College of "Agriculture and the Mechanic Arts."

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### *Boys' and Girls' Contest for 1909.*

The Farmers' Institute Department of the Kansas State Agricultural College announces its plan for the contests for the boys and girls for the coming year. The Institute Officers' Conference voted on the following plan for this year:

1. For boys' corn contest, three classes—(B) boys 10 to 15 years of age; (A) boys 15 to 21 years of age; (Special) boys who have attended one or more sessions of the State Farmers' Institute, or who have had elsewhere any special drill in corn judging. Boys of B class to plant either one or two quarts of corn (at option of county committee); the committee to furnish the corn free or at ten cents per quart; prizes next fall to be cash or merchandise. Boys of both the A and the Special class to plant twelve ears of well-bred corn of their own raising, if they have it; if not, to be furnished by the committee at cost or at not to exceed fifty cents for the twelve ears. Boys may secure their seed corn elsewhere if they choose, although urged to take one of the varieties recom-

mended by the Kansas Corn Breeders' Association. However, a boy will be commended for taking twelve ears of any good yielding corn, although unnamed, and starting in to breed it up. The boys of the A class will compete at the institute next fall only with A boys, and boys of the Special class will compete only with boys of that class. These boys are urged to plant their own best twelve ears of corn instead of changing. The prizes for both the A and Special classes will be "trips to the State Institute." The entry at the local institute will be ten ears of corn.

2. Contests are also recommended for the boys in potatoes and with poultry. Particulars will be sent out in detail in a few weeks for these contests. In brief, the poultry contest will be with not to exceed two breeds of poultry, each boy or girl taking fifteen eggs from a pure breed and showing at the institute next fall the best trio, best pullet, best cockerel from this setting.

3. Contests for the girls under sixteen years of age (committees may make this age seventeen or have two classes (b) 10 to 14 and (a) 14 to 18).—Best loaf of bread, contestant to bake at least fifty loaves between May 1 and September 1, 1909; best pie (apple, peach, cherry, pumpkin), the girl to make at least twenty pies between above dates; best three cans of fruit, and to have canned at least twenty cans of fruit between the above dates; best sample of plain mending; best plain apron; best calico dress; best sample of darning. The prizes for these contests for A class to be trips to the State Institute, and for B class, cash or merchandise.

Committees are asked to arrange, if possible, for small prizes for best flower beds, the plot to be  $5 \times 6\frac{1}{2}$  feet. This will probably have to be by townships with a local judging committee.

Committees are also urged to arrange for garden- and potato-plot contests, the former to be  $50 \times 100$  feet and the latter  $50 \times 50$ , the prize to be awarded to the boy or girl producing the greatest number of pounds of vegetables and the greatest number of pounds of potatoes. Institute committees may well make two classes, one for town and city plots and the other for farm plots, the former to be turned over to a town or city committee.

Institute committees will do well to ask at once the coöperation of the county superintendent of schools in reaching the boys and girls of the county. These officers are anxious and willing to help, and their coöperation should be asked for at once.

Further suggestions will be given in the pamphlet to be issued in a few weeks. Address all correspondence to

*Superintendent Agricultural College Extension,  
Kansas State Agricultural College.*

*J. H. MILLER,  
Manhattan, Kan.*

**Commemoration of the Centenary of the Birth of Abraham Lincoln.**

The Grand Army of the Republic in Manhattan, in common with other posts throughout the country, has been making preparations for the proper commemoration of the birth of Abraham Lincoln. Recently the plan was enlarged so as to unite with the College in joint exercises. These will be held in the Auditorium, Friday, February 12, beginning at 2:30 P. M. Judge Schoonover, of Garnett, will deliver the address of the day, and his reputation as a speaker is such as to lead us to anticipate a treat for all. The program appears somewhat lengthy, but being of considerable variety it is believed that it will be enjoyed by all. It is hoped that the entire student body and the townspeople will unite in this recognition of the greatest American. The program is as follows:

Selection.....	College Orchestra
Introduction.....	Pres. E. R. Nichols
Prayer.....	Rev. J. W. Hannum
“God of the Nations”.....	College Chorus
The Boyhood of Lincoln.....	Mrs. Mabel Zahnley
“The Star Spangled Banner”.....	Kollege Kwartet
Six Sentences by Noted Americans.....	Women’s Relief Corps
“Oh Why Should the Spirit of Mortal be Proud?”.....	Mrs. Bernice Dodge Ferris
Address.....	Judge Manford Schoonover, Garnett, Kan.
“Tenting on the Old Camp Ground”.....	Kollege Kwartet
Lincoln’s Gettysburg Address.....	Prof. J. E. Kammeier
What Made Lincoln Great?.....	Mr. Worth Ross
“The Boys of the Old Brigade”.....	Kollege Kwartet
Five Sentences From Noted Americans.....	Pupils from the Central School
Five Stanza Poem.....	Pupils from the Central School
“America”.....	Chorus and Audience
	Benediction.

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Manhattan has a beautiful city park of forty-five acres situated at the center of the town site. It is well planted with shade trees and bushes and there is hardly a poor tree on the grounds. The park keeper has just completed his job of counting them and has found that there are: Maples, 105; cottonwoods, 45; oaks, 135; elms, 877; box elders, 142; honey locusts, 61; ashes, 302; sycamores, 21; wild cherries, 32; pines, 115; cedars, 90; mulberries, 30; willows, 18; Osage orange, 50; hackberries, 26; birches, 5; black walnut, 1; apples, 2; coffee beans, 8; redbuds, 5; total, 2065.

***Local Notes.***

Professor Kinzer was at Denver last week acting as judge in the Rocky Mountain Live Stock Show.

Prof. A. M. TenEyck has just published a press bulletin concerning the College distribution of improved seed-wheat.

The annual Y. M. C. A. State Convention was held at Lawrence, February 4 to 7. The College delegation numbered about a dozen.

The Mechanical Department is planning to replace the present 150-horse-power dynamo in the engine room with a new one of much greater capacity.

A sale of Duroc-Jersey hogs was held in the judging pavilion on Friday. The sale was in charge of the Duroc-Jersey Breeders' Association of Kansas and the proceeds will go toward the prize fund of the first State fair. The animals were contributed by the breeders, and they certainly were beauties.

Good work. Supt. J. H. Miller, of the Farmers' Institute Department, reports that the total number of institutes held in the State since July 1 is 165, while the total number planned for February and March is 83. This will make a grand total for the nine months of 248. Of these there were held in August 9, in September 30, in October 35, in November 43, in December 21, and in January 27. Thirty of the summer institutes were held in groves.

Senator Carey introduced a resolution in the senate Thursday morning, which was adopted, that the members of the legislature by voluntary contribution raise a fund to purchase a souvenir for the students of the Agricultural College, in appreciation of the treatment of the members when at Manhattan yesterday. "It might be fitting," suggested President Fitzgerald, "that the senator from Reno (Carey) start this fund with a contribution of \$50." "I'll stand hitched," said Senator Carey, "and I'll give \$50."

*The Kansas Aggie* is the name selected by the students of the printing course for their new practice publication. At a meeting the students of the course organized the K. S. A. C. Press Club, which will put out the new enterprise. The staff of the *Kansas Aggie* is as follows: Editor, C. J. Stratton; managing editor, Harlan D. Smith; advertising manager, L. B. Mickel; athletic editor, C. S. Kenmore; local editor, A. E. Anderson; literary editor, Geo. Hungerford; reporters, W. H. Goldsmith, L. C. Shanton, J. F. Allen, and M. S. Laude.

At the present time our College is subject to the critical gaze of flaw-searching eyes. Never before have the eyes of the public been turned our way for such a thorough investigation of our school as now. Our enemies are pointing their fingers at everything in our school that would injure our influence with the people of the State. Our friends are pointing with pride to those characteristics of K. S. A. C. that make her what she is, the greatest school in the West for the education of young Kansans who are industrially inclined.—*Herald*.

***Alumni and Former Students.***

John M. Scott, '03, is continuing the good work of agricultural extension by means of press bulletins from the Florida Experiment Station, the latest numbers being upon "A Spring Balance in the Dairy" and "Soil Preparation."

J. W. Berry, '83, a former Regent of the College, was here Wednesday taking the opportunity to meet the members of the legislature in order to talk with them concerning College affairs as he sees them. Mr. Berry had a warm welcome from his many friends on the hill.

Flora Rose, '05, lecturer in home economics at Cornell University, is the author of a pamphlet on "The Laundry" which is the January number of the Cornell Reading Course for Farmers' Wives. The pamphlet shows great care in preparation and should be of much assistance to housewives in lightening the burdens of wash-day.

Arthur F. Cranston, '90, received an ovation last Wednesday when as a member of the legislature he was called out to make a speech on the occasion of the meeting of the legislature with us in chapel. His short address was much appreciated by the students and his presence in the legislature became doubly a source of satisfaction after hearing him. H. W. Avery, '91, is a member of the senate and accompanied the excursion, but had left the Auditorium before he was called on.

Changes of address: Nickolas Schmitz, '04, Riverdale, Md.; Clara Pancake, 1422 Poplar street, Philadelphia, Pa.; Lucy H. Waters, '94, 131 E. Flora street, Stockton, Cal.; W. P. Schroeder, '06, Enid, Okla., in care of Continental Creamery Company; Mamie Hassebroek, '04, and Edith Coffman, '06, Hayward, Wis.; H. A. Spuhler, '06, 1109 Cleveland Avenue, Kansas City, Mo., C. J. Axtell, '04, 17 Barrett street, Schenectady, N. Y.; Geo. L. Melton, '93, 500 No. Lake Avenue, Pasadena, Cal., Fred Zimmerman, '98, Cheney, Kan.

The recent events have called out the loyalty of alumni from all parts of the State and Nation. The Topeka association met and passed resolutions opposing certain legislation regarded as opposed to the interests of the College. The Chicago alumni have held a meeting to consider what can be done by them, and the Manhattan association through its committees has taken an important part in supplying the members of the legislature with information concerning the College and its work. Never before has there been such a manifestation of the love of the graduates and former students for Alma Mater, and the propriety of a greater recognition of them on the Board of Regents is emphasized. There is an abundant supply of good material for Regents among the alumni resident of this State, and it is to be hoped that the governor will look favorably upon them.

## THE INDUSTRIALIST.

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(Board of Instruction concluded on last page.)

# THE INDUSTRIALIST

VOL. 35.

MANHATTAN, KAN., FEB. 13, 1909.

No. 16

## *The Kansas Audubon Society.*

A few months ago there was organized at Wichita a new State society whose aims and purposes should attract alike the sentimental and the practical among us. We refer to the Audubon Society of Kansas. Our State is the thirty-seventh to come into line in the matter of organizing to protect the harmless wild birds in general from the fate that has already overtaken several species of their number. While this large list of state Audubon societies augurs well for the success of the movement, it is no particular credit to Kansas that we should trail along into camp after the campaign was well under way. However, now that we are organized we can make amends for our tardiness by well-planned and vigorous action. It is the purpose of this article to call attention to some phases of the Audubon society work and to offer a suggestion or two which may be taken for what they are worth.

The objects of the Kansas Audubon Society, as set forth in a circular recently published, are:

1. To discourage the destruction of harmless wild birds and their eggs, particularly the killing of non-edible birds in order to display feats in marksmanship, such as is frequently the case with swans, pelicans, coots, gulls, nighthawks, etc., which are left to decay, and also to employ all legitimate means to prevent the propagation of game-hog methods in obtaining game birds. All birds that are generally destructive to horticultural and agricultural interests are proscribed.

2. To create a healthy sentiment against ornamentation with feathers of wild birds which must be killed to meet an unnecessary and unnatural demand.

3. To assist in the preservation of wild game by discouraging unreasonably long open seasons for hunting, and particularly the hunting of any harmless species during its breeding season.

4. To encourage the importation and distribution of wild birds and animals in and to such localities as may become depleted of the same, and to arouse popular interest in a rigid enforcement of

all State, county and municipal laws for the protection of harmless wild birds and animals generally.

5. To disseminate information, by lectures, written papers, published documents, or otherwise, respecting the economic importance of bird life to agricultural and horticultural interest and the welfare of mankind, and to acquire and maintain a library to the end that all classes of citizens may become acquainted with the habits and needs of birds.

6. To aid other organizations in the establishment of forest reserves and in the acquisition of the wild lands by cities and towns as parks.

7. To urge and encourage the setting apart of refuges and breeding retreats for wild birds and game animals on the United States forest reservations and state public domain.

8. To encourage nature study and bird and Arbor Day exercises in the schools.

It will readily be seen that the aims of an Audubon society are in pursuance of a policy that has begun to take definite shape in our country only recently—the conservation of our national resources. No thinking person will deny that we have been prodigal in our use of the riches with which nature has endowed us—our own possessions, to be sure, but also the heritage of millions yet unborn. Our forests, our mines, the wild life of wood, field and stream have alike suffered from selfish greed on the one hand or from carelessness and indifference on the other.

It has come to be very generally conceded that all wild birds and animals are the property of the state. In fact, most if not all of our states have so declared in legal enactment. As a further step in the right direction, it is confidently expected that in the working out of our national resource problems federal jurisdiction over at least certain classes of wild animals will be asserted.

The National Audubon Society, with headquarters in New York City, has been working for a number of years to secure the adoption by the several states of a uniform law for the protection of birds other than game. The efforts of this organization to arouse a greater interest in bird life and to secure protection for the decreasing numbers of our feathered friends, are worthy of our highest commendation. One after another thirty-five of our state legislatures have adopted, with or without some changes, the model bird law recommended by the United States Department of Agriculture and by the National Association of Audubon Societies. It is worthy of note that the enactment of this law, particularly in a number of the Southern States, was the result of an insistent

demand from agricultural communities suffering from or threatened by insect invasion.

Though we may depend upon recruiting and training in a few months a volunteer army which can cope with any human foe that invades our land, we can not long resort to this plan when hordes of insects threaten. It will require more power than the average farmer possesses to conjure up the ghosts of slaughtered birds to fight his battles. Careful estimates from reliable sources place the annual loss to agriculture from the ravages of insects and injurious animals at about \$800,000,000. One of the most efficient checks to these ravages is bird life. What the result will be in future years, if we continue to interfere in nature's method of preserving the balance of power by destroying her bird army, can easily be foreseen.

Kansas is one of five states east of the Rocky Mountains that is still without a model bird law. Our present law, such as it is, merely enumerates a small list of protected species, and in the case of those that are classed as game gives an open season in which they may be shot. It is a much better plan to have two separate laws covering the cases of the game and the non-game birds, respectively. When dealing with the latter the provisions of the law should not extend merely to a small list named in the act, but should include all birds except a very few designated as outlaws. In Kansas we have about 340 species of birds, a little more than half of which number may be said to be common. Our law as it now stands protects but seventeen of these—ten game birds and seven song birds. Eggs and nests of all species may be plundered without violation of any Kansas statute.

The enactment of a model law protecting the non-game birds in Kansas should be delayed no longer. Such legislation fortunately does not involve any of the contentions and compromises usually attending the passage of a game act. A bill to protect our non-game birds should receive the support of every member of the present legislature who has the agricultural interests of the State at heart.

A form of bill similar to those which have been enacted into a model law in other states has been prepared by the Kansas Audubon Society. The text is as follows:

AN ACT for the Protection of Birds and Their Nests and Eggs.

*Be it enacted by the Legislature of the State of Kansas:*

SECTION 1. That all wild birds, both resident and migratory, in this State, shall be and are hereby declared to be the property of the State.

SEC. 2. That no person shall within the State of Kansas kill or catch or have in his or her possession, living or dead, any wild bird other than a

game bird, or purchase, offer or expose for sale, transport or ship within or without the State, any such wild bird after it has been killed or caught, except as permitted by this act. No part of the plumage, skin or body of any bird protected by this section shall be sold or had in possession for sale, irrespective of whether said bird was captured or killed within or without this State. For the purposes of this act the following only shall be considered game birds: The Anatidæ, commonly known as geese, brant and river and sea ducks; the Rallidæ, commonly known as rails, coots, mud-hens, and gallinules; the Limicolæ, commonly known as shore birds, plovers, surf birds, snipe, woodcock, sandpipers, tatlers, and curlews; the Gallinæ, commonly known as wild turkeys, grouse, prairie-chickens, pheasants, partridges, and quails; and Zenaidura macroura, of the family Columbidæ, commonly known as the turtle or mourning dove; provided that all swans, pelicans, gulls, herons and cranes shall not be killed or in possession at any time, except as permitted by Sections 6 and 7 of this act. All other species of wild birds, either resident or migratory, shall be considered non-game birds.

SEC. 3. That no person shall, within the State of Kansas, take or needlessly destroy or attempt to take or destroy the nest or the eggs of any wild bird, or have such nest or eggs in his or her possession, except as permitted by this act.

SEC. 4. That no person or persons or any corporation acting as a common carrier, its officers, agents, or servants, shall ship, take, carry or transport, either within or beyond the confines of the State, any resident or migratory wild non-game bird, except as permitted by this act.

SEC. 5. That any person who violates any of the provisions of this act shall be guilty of a misdemeanor and shall be liable to a fine of five dollars for each offense and an additional fine of five dollars for each bird, living or dead, or part of bird, or nest, or eggs, or part thereof, possessed in violation of this act, or to imprisonment for thirty days, or both, at the discretion of the court.

SEC. 6. That Sections 2, 3, 4, and 5 of this act shall not apply to any person holding a certificate giving the right to take birds, their nests, or eggs for scientific purposes only, as provided for in Section 7 of this act, or to any person in possession of a private collection of same at time of passage of this act.

SEC. 7. That certificates may be granted by the Secretary of State to any properly accredited person of the age of fifteen years or upward, permitting the holder thereof to collect birds, their nests or eggs for scientific purposes only. The applicant for the same must present to said officer written testimonials from two well-known recognized ornithologists, who must be residents of the State of Kansas, certifying to the good character and fitness of said applicant to be intrusted with such privilege, and must pay said officer one dollar to defray the necessary expenses attending the granting of such certificate. On proof that the holder of such certificate has killed any bird or taken the nest or eggs of any bird for other than strictly scientific purposes, his certificate shall become void, and he shall be liable to a fine of one hundred dollars or imprisonment of thirty days, or both, at the discretion of the court.

SEC. 8. That the certificates authorized by Section 7 of this act shall expire on the 31st day of December of the year issued, and shall not be transferable.

SEC. 9. That the English or European house sparrow, great horned owl, sharp-shinned hawk and Cooper's hawk are not included among the birds protected by this act; provided further, that this act shall not prevent the owner of orchards or berry gardens from killing blue jays and Baltimore Orioles at any time for the protection of such orchards and berry gardens.

SEC. 10. That nothing in this act shall prevent a citizen of Kansas from taking or keeping any wild non-game bird in a cage as domestic pet, provided that such bird shall not be sold, or exchanged, or offered for sale or exchange, or transported out of the State.

SEC. 11. All acts or parts of acts heretofore passed inconsistent with or contrary to the provisions of this act are hereby repealed.

SEC. 12. This act shall take effect and be in force from and after its publication in the statute-book.

This bill has stood the test of courts and has been proven to be legally unassailable. It has been heartily endorsed by resolutions of both the Kansas State Horticultural Society and the Kansas Academy of Science, recently in session. THEO. H. SCHEFFER.

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### ***The Object of Military Training in Educational Institutions.***

Military drill imparts manliness, alertness, respect for authority, and consideration for others. Its purpose is to make good citizens of those receiving it, to qualify them to be useful to their country in time of need, and to impress upon their minds the fact that the building of character is as important as the building of factories or railroads. It contributes to the development of American learning and ideal citizenship. Compare, if you please, the young men taking the military course at this College with an equal number of those who have never taken it, and give a candid opinion as to which group shows the finest sense of honor and consideration for the rights and feelings of others.

The military instruction at this College is patterned as closely after the regular army as the time allotted will permit, and, having for its object the training of the cadets to use their strength, minds and wills together, adds greatly to their efficiency in the courses they undertake in the several departments of the institution and assists in preparing them for their life's profession after graduation.

In this connection we might cite some of the duties and obligations required of the cadet which must necessarily benefit him in the future. The first lesson to be learned is obedience to authority. Not because the thing ordered is right, but because it is ordered. *This is discipline.* Of course the order should be just and reasonable and based upon proper authority; otherwise discipline cannot be maintained.

An English army officer defines discipline to be "that long continued habit by which the very muscles of the soldier instinctively obey the word of command, so that under whatever stress of circumstances, danger, and death, he hears the word of command, even if his mind be too confused and astounded to attend, yet his muscles will obey."

Another feature of importance is the spirit of loyalty engendered by the close association of the members of the companies while occupying different stations in rank. Nothing brings out the character of each officer, non-commissioned officer and private more clearly than the trust, support and loyalty displayed between superiors and subordinates while carrying out the orders demanded in military drill.

Loyalty and discipline go hand in hand, and success in any path in life is insecure without these attributes. Discipline is acquired, while loyalty is in the character of the man. Any flaw in character that leads to disobedience or disloyalty may, in after life, prevent the ability of seizing many good opportunities. Also, the body building, which is a natural result of the physical exercise required in the maneuvering portion of the instruction, is not the least of the many advantages derived from a military training. Milton says: "I call a complete and generous education one which fits a man to perform, justly and skilfully, all the offices, both public and private, of peace and war."

War is an unusual occurrence at this stage of civilization; but to preserve peace, armed forces are necessary to protect the nation from possible oppression and to quell internal disorders, so that the teachings in the art of handling the rifle and being able to hit at which you aim better qualifies the average citizen to assist in maintaining this desired peaceful situation.

While the duties of the cadet officer and non-commissioned officer at these institutions are prescribed and the instruction limited to the rudiments of the art of war, yet the training received makes them of inestimable value to their country in time of need, especially the officers who elect the work during their junior and senior years. Their ability to hold commissions in the volunteer army in case of war would be readily assured. In my opinion an appropriate ending to this article, which can apply to other vocations in life, is Alexander Hamilton's definition of a perfect officer: "He who combines the genius of the general with the patient endurance, both mental and physical, of the private; who inspires confidence in himself and in all under him; who is at all times

the gentleman, courteous alike to inferior, equal, and superior; who is strong and firm in discipline, without arrogance or harshness, and never familiar towards subordinates, but to all is the soul of courtesy, kind, considerate, and just." CHAS. H. BOICE.

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*The American Society of Animal Nutrition.*

Last summer in connection with the Graduate School in Agriculture held under the auspices of the Association of Agricultural Colleges and Experiment Stations at Cornell University a conference of investigators in animal nutrition was held, and the advisability of effecting a permanent organization was determined upon, and a committee was appointed to consider the matter further and with authority to call a meeting for the purpose of forming a permanent organization. This committee called such a meeting in connection with the International Live Stock Exposition at Chicago, November 28, 1908. The committee had carefully prepared the way by drafting a proposed plan of organization, which, after considerable discussion and modification, was adopted. In the report of the committee a brief review was given of the earlier work in animal nutrition, and its difficulties and relatively small value were brought out. It was, however, strongly presented that the time has come for placing such investigations upon a more thoroughly scientific basis, and the belief was expressed that much more could be accomplished by coöperation among the investigators of different stations, especially if the helpful council of those best qualified could be enlisted for it. The committee also presented a paper by way of suggestion of problems for investigation that will probably serve as a basis for the future work.

The object of the society, as set forth in the constitution, is as follows:

"The objects of the organization shall be to improve the quality of investigation in animal nutrition, to promote systematic and better correlated study of feeding problems, and to facilitate personal intercourse between investigators in this field."

All persons engaged in investigation or instruction in animal nutrition and related subjects in the United States and Canada are eligible to membership. In addition to the ordinary officers of a society, this one provides for a registrar of elections, who is to conduct the election of officers by mail according to plans adopted by the society, and a committee on experiments, which is the most important feature of the organization. Concerning this, the constitution provides that "The Committee on Experiments shall

recommend to the Society at its regular annual meeting problems for independent and coöperative investigation, and submit a report on the experiments in progress. Projects approved by the Society shall be carried out under the direction of the Committee, which shall have authority to work out the details of plans, solicit coöperation, and collate the results of the investigations. Each individual or organization participating in the coöperative experiments may publish its own results if it so desires, but the Committee shall collate, edit and prepare a full report upon the investigations as a whole. The Committee shall also have authority to collate recorded results bearing upon the problems selected for coöperative investigation, so far as it shall find it practicable to do so."

It is apparent that if this society can hold meetings and actually execute the program as planned it should be greatly to the advantage of the investigators in animal nutrition. The feeding experiments conducted by the various stations have in too many cases in the past had too little to recommend them in the way of scientific accuracy and have contributed almost nothing to our knowledge of the science of nutrition. The officers elected are as follows: President, H. P. Armsby, of Pennsylvania; vice-president, C. F. Curtiss, of Iowa; secretary and treasurer, D. H. Otis, of Wisconsin; registrar of elections, J. T. Willard, of Kansas. The members of the Committee on Experiments are: H. J. Waters, of Missouri; H. W. Mumford, of Illinois; T. L. Haecker, of Minnesota; W. H. Jordan, of New York; E. B. Forbes, of Ohio.

J. T. WILLARD.

#### *Pure Insecticides and Fungicides.*

In this time of revival and quickening of the business conscience in which good resolutions are backed up by good legislation, the object of which is to protect the consumer and honest manufacturer and tradesman, it is not surprising that the question of insecticides and fungicides has received attention.

Ever since chemical means of combating insect and fungus foes were first introduced there has been much fraud in connection with the quality of the materials sold, and even great uncertainty when conscious fraud was not intended. Some of the manufacturers of such chemicals, in coöperation with agricultural chemists and with entomologists, have united upon a bill for preventing the manufacture, sale or distribution of adulterated or misbranded fungicides, Paris greens, lead arsenates, and other insecticides, and for regulating the traffic therein. This bill is before the

House of Representatives as H. R. No. 21318, and before the Senate as No. 6515. The measure is being opposed by certain manufacturers, and it is doubtful if it will pass at the present session.

The importance of some adequate legislation touching these preparations should be evident to all. It is not merely a question of paying a few cents or dollars for a worthless article, but an entire crop may be lost because of having placed confidence in or depended upon an ineffectual remedy. All interested in an enactment of adequate legislation relating to this matter would do well to correspond with their senators and representatives in Congress.

J. T. WILLARD.

### *The Value of Physical Training.*

Education is not complete without the training of physical power. "Strong mental powers encased in weak bodies are limited." With a more thorough knowledge of the laws which govern health there would be more general recognition of nature's methods for physical perfection, and some parts of our bodies would not be allowed to develop at the expense of others.

In our student type we find girls with weak, contracted chests and drooping shoulders, caused by the weak condition of the chest and back muscles. The strength of the body is not proportionately distributed, and unless some means is resorted to by which the weak parts are restored a loss of health is the ultimate result.

The time has passed when it was considered permissible for a young lady to be delicate and frail. Now the sturdy, well-developed girl who can row, swim, play basket-ball and tennis, and engage in out-of-door sports without complaining of fatigue, wins much admiration.

No girl should be allowed to grow up without physical training, which should be supplied when the body is growing. If the body is not made strong and well developed before twenty, it is not likely to become so after that time. The size of the muscles is determined during the growing period, as is the skill in using them. If they are well developed during this period it is permanent, and the vigor that goes with it means not only physical capital but mental resource.

In recent years physical training has been more respected, and is the balance-wheel which sets things aright by establishing an equilibrium between powers physical and powers mental. We all admit that without a good physical foundation there is little that can be permanently built along the line of intellectual or moral superstructure. But this is true also: The functional improvement

of the nervous mechanism is the most important effect of muscular exercise; in other words, muscular training develops brain power and is therefore to be reckoned with as a definite and very positive means of building the intellectual and moral system.

The value of the work can not be more forcibly presented than in an article of Marion's, in which he says, "Physical perfection serves to assure moral perfection. There is nothing more tyrannical than enfeebled organism; nothing sooner paralyzes free activity of the reason, the flight of the imagination, and the exercise of reflection; nothing sooner dries up all the source of thought than a sickly body, whose functions languish, and from which every effort is a cause of suffering. Then have no scruples if you would form a soul which is to have ample development, a man of generous and intrepid will, a workman capable of great undertakings and arduous labors, first and above all secure a vigorous organism of powerful resistance and muscles of steel."

All emotion is expressed by muscular movement; muscular movement is controlled by the will; then the control of the muscles by the will is physical education in the highest sense, and we get the development of the highest kind of will—self mastery.

MARGUERITE E. BARBOUR.

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A bill was lately introduced in the House of Representatives which regulates the detailing of officers of the army for college duty, for duty with organized militia, for duty with the care of Indians, etc. This bill, should it become a law, will prohibit the Secretary of War from detailing active officers to teach military science and tactics in land-grant colleges. It allows, however, the employment of retired officers below the rank of colonel for such duties, if there are any who desire such a position, at full pay instead of retirement at part pay.

You can achieve a certain measure of true success--believe in it; think of it; be worthy of it; fit yourself for it; work for it; and you will achieve it.

# STUDENTS' RECITAL

Department of Music, K. S. A. C.

Auditorium

Thursday Evening, February 18, 1909

8 o'clock

1. Prima Donna ..... *Herbert*  
COLLEGE ORCHESTRA.
2. Piano—Menuet Op. 14 No. 1 ..... *Paderewski*  
GRACE TERHUNE.
3. Piano—Scherzo b min ..... *Chopin*  
EUGENIA FAIRMAN.
4. Vocal—Bells of St. Mary's ..... *Rodney*  
R. HUNTER.
5. Piano—Barchetta ..... *Nevin*  
CLARA KLEWER.
6. Piano—Kamenna Ostrow ..... *Rubenstein*  
RUTH TAYLOR.
7. Piano—*a.* Valzer Gentile ..... *Nevin*  
*b.* Tournament ..... *Nevin*  
LEONORA FRIEDRICH.
8. Vocal—The Pirate ..... *Gurnbert*  
F. H. ALLIS.
9. Piano—Shepherds All and Maidens Fair ..... *Nevin*  
IRENE INGRAHAM.
10. Piano—Mazurka Eb ..... *Leschetiszk*  
FLORINE FATE.
11. Piano—Liebes Valzer ..... *Mowskowzki*  
MARGARET MORRIS.
12. Vocal—*a.* The Post ..... *Schubert*  
*b.* In Thy Dreams ..... *Buck*  
D. M. CAHILL.

***Local Notes.***

Professor Kinzer bought a very fine Angus cow at Waterville last week.

The College cadets attended the Lincoln memorial exercises in military order.

The Music Department will render "Paul Revere" at the annual musical festival.

The Animal Husbandry Department has sold one of the much admired teams of Percheron mares.

The College delegation to the Y. M. C. A. State convention at Lawrence last week numbered twenty-nine members.

Another victory! The College basket-ball team defeated the Nebraska Wesleyans in a spirited game in the Y. M. C. A. gymnasium by a score of 58 to 28.

To-day, February 13, the Riley County Farmers' Institute holds a meeting in the court-house to arrange for the boys' and girls' contests that are to be held next fall.

Manhattan is the best town of the 6000 class in Kansas. It is as solid as the stone which is commonly used for building purposes. A prettier town couldn't be pictured.—*Brown County World*.

The farmers' institute at Fredonia last week adopted a set of strong resolutions requesting the legislature to make enlarged appropriations for the Farmers' Institute Department of the Agricultural College.

Instructor H. H. King, of the Chemistry Department, has not missed chapel exercises since the beginning of the fall term and Miss Antonetta Becker, of the Department of Domestic Art, has been absent from chapel only once in three years and a half.

The first of the series of interclass girls' basket-ball games will be played March 8. The winning team will secure possession of the Askren trophy. If won three years in succession by a class it becomes their permanent property. The '09 team has held the trophy for two years.

Manhattan is blessed with two brand new dailies, the *Daily Nationalist*, and the *Daily Mercury*. These, in addition to the two semi-weeklies, the four weeklies and the monthly published in the city, should be able to spread the local news "perty well" to all parts of the townsite.

L. A. Fitz, '02, government expert in grain standard work, located at Fargo, N. D., visited College Friday and Saturday. He was making a trip through the wheat regions of Kansas and other western states to gather samples of winter wheat for milling tests which he is making at the grain mill of the North Dakota Agricultural College, at Fargo. Mr. Fitz looks bright and energetic—like a young man who has found his proper life-work and is enjoying every bit of it.

The subfreshmen had a highly successful reception at Domestic Science and Art Hall last Saturday night.

The Bacteriology Department has recently issued a press bulletin on "Field Tests with Experimental Horse Serum Hog Cholera Vaccine." The bulletin also contains a report of progress of the extensive investigations carried on by the Experiment Station concerning vaccines of various other kinds.

It has been urged often and vigorously that the alumni of the Kansas State Agricultural College should have a larger representation on the Board of Regents. In the light of recent events the question is again brought up, and a plan to lay this matter before the Governor is being considered. Much misrepresentation and needless friction could be avoided if all members of the Board were intimately acquainted with the needs and policy of the institution.—*Daily Nationalist*.

Senator Avery, of Clay county, has introduced a bill in the Senate for placing the State forestry work under the management of the Agricultural College. The bill provides for carrying out in a more extended manner the forestry work now being done, and provides for a department of forestry here with a forester in charge. A \$10,000 appropriation would be needed to carry out the provisions of the bill. The Topeka *Capital* says, concerning the bill: "Director Webster, of the Experiment Station at Manhattan, and Professor Dickens, of the Forestry Department, say they are willing to carry on the forestry work in connection with their regular College work. The Agricultural College is carrying on effective work now with limited means. From the fact that such men as Professor Hall, first assistant in the Department of Forestry at Washington, and Professor Kellogg, the second assistant, are both graduates of the Forestry Department at the Agricultural College, shows that this department is thorough and is in the proper hands to carry on the state-wide forestry work."

The commemoration exercises of the birth of Abraham Lincoln, held in the College Auditorium, February 12, under the auspices of the G. A. R. of Manhattan and the College, were well attended by citizens and students. Every seat in the spacious hall was occupied and the attendance must have numbered fully 2500. The program of exercises was published in the last INDUSTRIALIST. It consisted of a number of patriotic selections by the College orchestra, the College chorus, and the glee club, recitations and quotations by pupils of the city schools, short addresses by Mrs. Mabel Zahnley, Mrs. Ferris, student Ross, and Professor Kammeier, and a principal address by Judge Manford Schoonover, of Garnett, Kan. Every number was well rendered and well received. The oration of the Judge was addressed chiefly to the students, whom he impressed with the fact that Lincoln, though of humble birth, was one of the greatest characters of all times and all nations, and that his life was a life to be studied and emulated. Professor Kammeier quoted the dead president's immortal Gettysburg address, the incidents of its delivery, and the experiences of Lincoln on the day following. The exercises closed with the singing by the audience of "My Country 'Tis of Thee."

*Board of Instruction (concluded).*

|                                                                 |                                        |
|-----------------------------------------------------------------|----------------------------------------|
| Miss Ada Rice, B. S. (K. S. A. C.)                              | Instructor in English                  |
| Miss Ella Weeks, A. B. (U. of K.)                               | Instructor in Drawing                  |
| Miss Daisy Zeininger, B. A. (Fairmount)                         | Instructor in Mathematics              |
| Leonard W. Goss, D. V. M. (Ohio State University)               | Instructor in Veterinary Science       |
| Miss Ula M. Dow, B. S. (K. S. A. C.)                            | Instructor in Domestic Science         |
| Theo. H. Scheffer, A. M. (Cornell University)                   | Instructor in Zoölogy                  |
| Herbert H. King, M. A. (Ewing College)                          | Instructor in Chemistry                |
| John B. Whelan, M. A. (Nebraska)                                | Instructor in Chemistry                |
| Louis H. Beall, A. B. (Denison)                                 | Instructor in English                  |
| Roy A. Seaton, B. S. (K. S. A. C.)                              | Instructor in Mechanical Engineering   |
| William L. House                                                | Foreman of Carpenter Shop              |
| Louis Wabnitz                                                   | Foreman of Machine Shops               |
| Miss Ina E. Holroyd, B. S. (K. S. A. C.)                        | Assistant in Preparatory Department    |
| Ambrose E. Ridenour, B. S. (K. S. A. C.)                        | Foreman of Foundry                     |
| Miss Emma J. Short                                              | Assistant in Preparatory Department    |
| Miss Ina Cowles, B. S. (K. S. A. C.)                            | Assistant in Domestic Art              |
| Miss Kate Tinkey                                                | Assistant Librarian                    |
| Earl N. Rodell, B. S. (K. S. A. C.)                             | Assistant in Printing                  |
| M. Francis Ahearn, B. S. (Mass. Ag. College)                    | Assistant in Horticulture              |
| Miss Gertrude Stump, B. S. (K. S. A. C.)                        | Assistant in Domestic Art              |
| M. Sheldon Brandt, Ph. B. (Yale)                                | Assistant in Architecture and Drawing  |
| Chas. Yost                                                      | Assistant in Heat and Power Department |
| Earle B. Milliard                                               | Foreman of Blacksmithing               |
| J. T. Parker                                                    | Assistant in Woodwork                  |
| J. D. Magee, A. M. (Chicago)                                    | Assistant in Mathematics               |
| E. G. Meinzer, A. B. (Beloit)                                   | Assistant in German                    |
| Miss Florence S. Latimer, B. M. (Ferry Hall Seminary)           | Assistant in Music                     |
| Miss Marjorie Russell (Mechanics' Institute)                    | Assistant in Domestic Science          |
| Burton Rogers, D. V. M. (Iowa State College)                    | Assistant in Veterinary Science        |
| Miss Clara Willis (Framingham Normal)                           | Assistant in Domestic Science          |
| C. O. Swanson, M. Agr. (Minn.)                                  | Assistant Chemist, Experiment Station  |
| Edw. C. Crowley, Ph. B. (Yale)                                  | Assistant in Chemistry                 |
| Hugh Oliver                                                     | Assistant in Heat and Power Department |
| Miss Charlaine Furley, B. A. (Fairmount)                        | Assistant in English                   |
| Miss Jessie Reynolds, A. B. (U. of K.)                          | Assistant in Preparatory Department    |
| Miss Mary F. Nesbit, A. B. (Illinois University)                | Assistant in Mathematics               |
| Miss Annette Leonard, A. B. (U. of K.)                          | Assistant in English                   |
| William C. Lane, B. S. (K. S. A. C.)                            | Assistant in Electrical Engineering    |
| Miss Flora C. Knight, A. B. (Uni. of Wyoming)                   | Assistant in English                   |
| Miss Grace H. Woodward (Boston School of D. S.)                 | Assistant in Domestic Science          |
| Miss Nellie Cave, B. M. (Univ. of Nebr.). (Chicago Music Coll.) | Assistant in Music                     |
| Miss Margaret Mack (K. S. N.)                                   | Assistant in Preparatory Department    |
| Edwin G. Schafer, B. S. (K. S. A. C.)                           | Assistant in Agronomy                  |
| Orin A. Stevens, B. S. (K. S. A. C.)                            | Assistant in Botany                    |
| Miss Mary W. Hancock (Mechanics' Inst.)                         | Assistant in Domestic Art              |
| S. W. McGarrah, A. M. (Grove City College)                      | Assistant in Mathematics               |
| Carl G. Elling, B. S. (K. S. A. C.)                             | Assistant in Animal Husbandry          |
| Kirk H. Logan, B. S. (U. of K.)                                 | Assistant in Physics                   |
| C. A. Arthur Utt, B. S. (Cornell College)                       | Assistant in Chemistry                 |
| Miss Florence Warner, A. B. (Illinois University)               | Assistant Librarian                    |
| Miss Anna Gordon, A. B. (Iowa College)                          | Assistant in Preparatory Department    |
| Miss Bertha M. Johnston (Simmons College)                       | Assistant in Domestic Science          |
| Harrison E. Porter, B. S. (K. S. A. C.)                         | Assistant in Mathematics               |
| E. L. Sieber, A. B. (Indiana University)                        | Assistant in Chemistry                 |
| C. S. Knight, B. S. Agr. (U. of Wis.)                           | Assistant in Agronomy                  |
| Earle Brintnall, B. S. (Iowa State College)                     | Assistant in Dairy Husbandry           |
| J. B. Parker, M. A. (Ohio State University)                     | Assistant in Entomology                |
| Allen G. Philips, B. S. (K. S. A. C.)                           | Assistant in Poultry                   |
| Miss Gertrude Cannon, Bethany Col. and Oberlin Conservatory     | Assistant in Music                     |
| Miss Bertha Bisby                                               | Assistant in Preparatory Department    |
| Fred M. Hayes, D. V. M. (K. S. A. C.)                           | Assistant in Veterinary Science        |
| L. D. Bushnell, B. S. (Wisconsin)                               | Assistant in Bacteriology              |
| Miss Bertha Donaldson (Chicago University)                      | Assistant in Domestic Art              |
| Miss Elizabeth Putnam (Chicago Art Institute)                   | Assistant in Drawing                   |
| L. E. Petty, A. B. (Wabash College)                             | Assistant in Mathematics               |
| Jules C. Cunningham, B. S. (K. S. A. C.)                        | Assistant in Horticulture              |
| Miss Annie E. Lindsey (Simmons College)                         | Assistant in Domestic Science          |
| H. E. Kirby                                                     | Assistant in Printing                  |
| John E. Smith, B. S. (Oregon Ag. Col.)                          | Assistant in Botany                    |
| R. C. Wiley, B. S. (Oklahoma A. & M. College)                   | Assistant in Chemistry                 |
| D. Edmond Rudolph                                               | Band Leader                            |
| Wm. A. Lamb                                                     | Poultryman                             |
| Floyd Howard                                                    | Farm Foreman                           |